VOL. 22, No. 11 NOVEMBER, 1945

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Published Monthly by the AMERICAN JOURNAL OF OPTOMETRY PUBLISHING ASSOCIATION,
1502 Foshay Tower, 821 Marquette Ave., Minneapolis 2, Minn.

ANNUAL SUBSCRIPTION $5.00 CANADA $5.50, FOREIGN $6.00
Single copies, 50c.

Entered as second-class matter, February 20, 1924, at the post office at Minneapolis 2, Minnesota, under the Act of March 3, 1879.
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The AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY serves as the official publication of the American Academy of Optometry. It is published monthly by the American Journal of Optometry Publishing Association under the editorial supervision of the American Academy of Optometry.

Publication Office: 1502 Foshay Tower, 821 Marquette Ave., Minneapolis 2, Minn


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*and* ARCHIVES *of*
AMERICAN ACADEMY OF OPTOMETRY


Vol. 22 — No. 11


## CONTENTS


ORIGINAL PAPERS — Page

Report on Ocular Reconditioning. William Smith ..... 499

EDITORIALS

Current Views on Optometric Progress. Carel C. Koch ..... 534

TRANSACTIONS OF THE ACADEMY ..... 536

ANNOUNCEMENTS ..... 540-546

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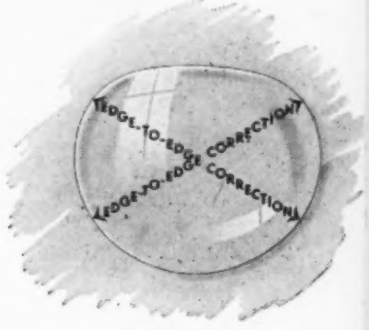

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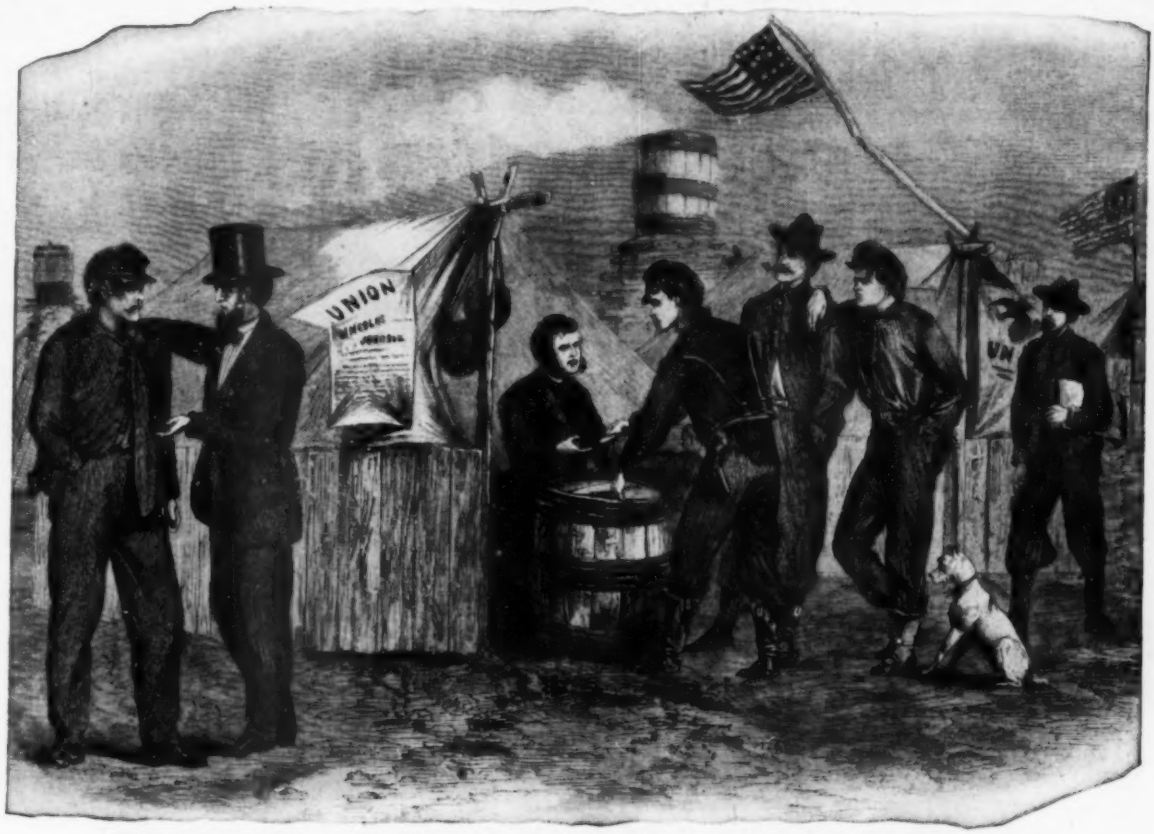


THE PRESIDENTIAL ELECTION—SOLDIERS OF THE ARMY OF THE POTOMAC VOTING AT THE POLLS.
—Courtesy The Bettmann Archive

# *When Lincoln was the President, in 1862...*

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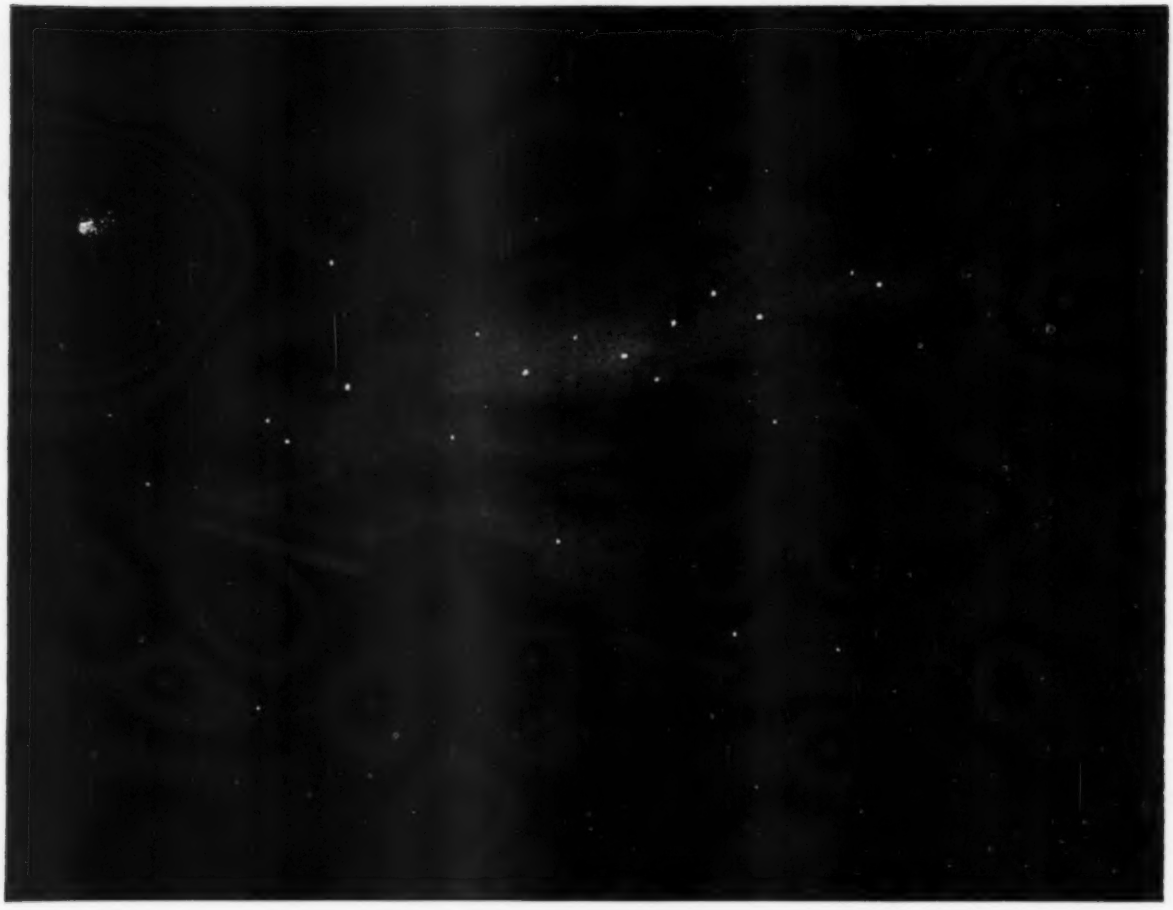

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# Public Misconceptions
## —about Elephants —about Glasses

AN ELEPHANT DOES FORGET

GLASSES ALONE CAN'T CORRECT FAULTY VISION

As far as memory is concerned, elephants are very much like human beings. Many of them have good memories, but the best of them can forget things. For example, Alice, a famous elephant of the Bronx Zoo, once mastered the trick of ringing a bell — then completely forgot how to do it. According to zoo keepers, the popular saying "elephants never forget" is a misconception.

There's another misconception which is far more serious. It's the notion that you can correct faulty vision merely by "buying a pair of glasses." Certain merchandisers blatantly advertise "bargain glasses" and "eyes examined free." The implication is that glasses are the primary factor, and that professional knowledge and technical services are so unimportant that they can be given away. That's wrong.

Glasses are important, of course, but your eye comfort and visual efficiency depend upon proper professional care. That means a careful examination and a great deal more: your eyes must also be refracted, your glasses prescribed, your prescription interpreted and later re-evaluated, your glasses fitted and serviced.

It is for these professional services that you pay a fee.

Glasses, alone, cannot correct faulty vision. What counts most is the professional skill and the technical services of your Ophthalmologist, Optometrist, Ophthalmic Dispenser (Optician).

Don't be satisfied with anything less than thorough eye care. Seek the professional skill and services that your priceless vision demands.

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*Seek professional advice—not glasses at a price.*

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PROFESSIONAL AND TECHNICAL SERVICES ARE ESSENTIAL TO EYE COMFORT AND VISUAL EFFICIENCY—The AMERICAN Plan

Appearing in the November 24 SATURDAY EVENING POST, November 27 LOOK and the December 3 LIFE, this full-page message will reach millions of people to tell them the story of professional eye care.

# HOW THIS NEW AO *Educational Message*

# BENEFITS YOU

Like the twenty previous AO educational messages that have appeared in national magazines for the past three and one-half years, this newest advertisement carries to the public a particularly pertinent story regarding the part that you, as a professional man, play in providing eye comfort and visual efficiency.

In keeping with the themes of previous messages in the series, this message too is "Dedicated to the Advancement of Professional Eye Care." And just what does this dedication mean? Simply this. By completely refraining from advertising brand name ophthalmic products to the public and devoting all its emphasis to the advancement of professional eye care, AO is helping to create a greater public understanding and appreciation of the fact that in eye care, it is professional skills and technical services which are the all-important factors—not glasses alone. Moreover, these messages focus attention on the fact that fees are for professional and technical services not merely the price of a pair of glasses.

Thus, in urging the public to seek professional advice—not glasses at a price, AO messages are creating public appreciation of professional and technical services.

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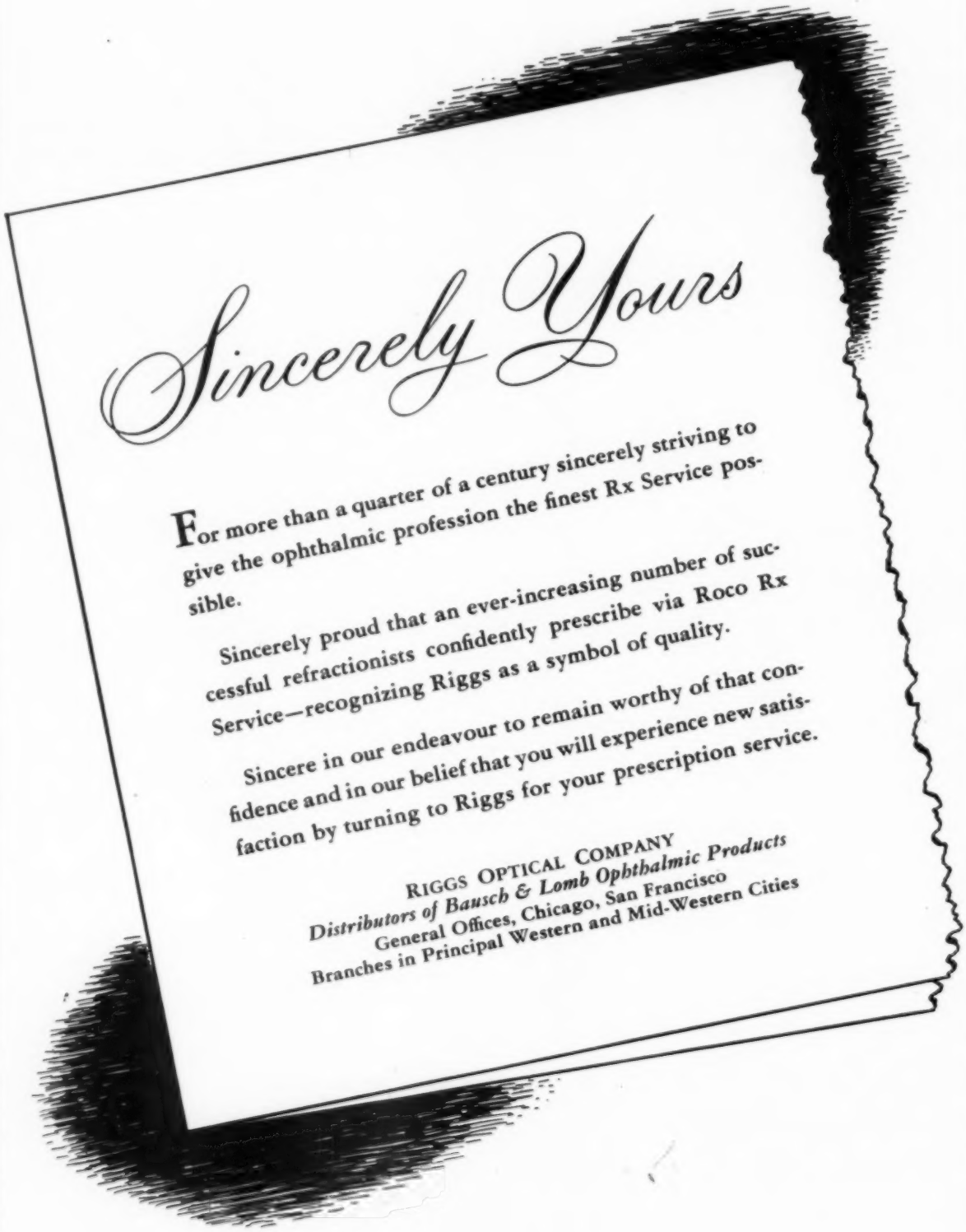
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Vol. 22 NOVEMBER, 1945 No. 11

# REPORT ON OCULAR RECONDITIONING*

William Smith, O.D., F.A.A.O.
Boston, Mass.

In an earlier series of articles[1,2] I reported results obtained in 43 cases of ocular anomalies which came to my attention. Following is a much more comprehensive report of 551 cases. Of these, 368 had anomalies of refraction; 125 had defects of color vision; 58 were cases involving the extra-ocular muscles. Nearly all the patients were rejectees from the armed services. Some were disqualified from obtaining positions in industries because of existing visual abnormalities. All were otherwise qualified.

In this article I am attempting to report data of results obtained in cases treated, besides trying to acquaint the optometric profession in general and those interested in orthoptics in particular, with the possibilities of ocular reconditioning. To do this, it will be necessary to redescribe methods, procedures and instrumentation. Some of the statements and some of the techniques may seem highly unorthodox, and they may appear inconsistent with the accepted teachings and theories of today.

In the history of science all new ideas and procedures advanced conflicted with the accepted theories and teachings of the particular day and era. Harvey had to contend with that; so did Lister and Pasteur and many another, and only recently the Australian nurse, Sister Kenny. One truth all scientists respect is "proof of accomplishment." Of what value is a theory if it is not backed by accomplished fact? Lancaster[3] in a masterly discourse on the story of asthenopia, cites the accepted "theories" and therapeutic procedures that were prevalent in the past century up to the time of Donders. It cannot be denied that the ophthalmologists of that era were high minded men whose sole concern

*An abridgment of the material presented at the annual meeting of the American Academy of Optometry at Chicago, Illinois, December 12, 1944, for publication in the November, 1945, issue of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY.

was helping to relieve suffering. However, were one to use those "therapeutic procedures" in this day, he would be considered a quack, or worse. Yet, one hundred years ago, those were the most up-to-date and indisputable techniques. And when these were finally shown to be erroneous, many reputable practitioners cried heresy and refused to renounce the old and accept the new.

What I am about to present here are clinical results with records so itemized as to give a comprehensive view of the problems involved. The problem of color vision is a most serious one. Unfortunately some well meaning practitioners are using methods unbecoming professional men in their efforts to attract attention to their work. As a result, there have appeared in the lay press[4] articles unequivocally denouncing any and all, attempting the training of this defect regardless of type. That this is an unfair and unjust criticism is shown by actual clinical results and from conclusions reached in a recent symposium conducted for the Optical Society of America. Dean Farnsworth[10] observes . . . "The results also show that there is a class of people who have low discrimination of colors without imbalance of color perception."

. . . and LeGrand Hardy[11] states . . . "There is only very general agreement between various test results, each test showing peculiarities in a few cases. For example, in a comparison of about 60 deficient subjects tested on the A. O. and the I. S. C. C. (Inter-Society Color Council) 4 high A. O. error scores show up in low I. S. C. C. error scores, but on the other hand, 7 low A. O. scores have high I. S. C. C. error scores, some of them very high, which would indicate that a number of red-green anomalous and red-green blind individuals are being passed by the A. O. test. There are peculiarities in all tests and we need to find out the cause for each of them before the job is done."

However, experience with 125 color defectives seems to indicate that the general classification of color blindness is much too broad. Many classed as color blind are really either color weak or color ignorant. Many, never having seen the test objectives before, become confused, especially when the test is given by a pharmacist's mate or army corporal whose training in the field frequently leaves much to be desired. Besides, a test however well given is of no actual value unless correctly interpreted. I chanced to examine a young man who was rejected by the navy air corps for color blindness. My examination, which followed very closely that at the recruiting center, indicated no such defect. In fact, this man's color sense was of the highest I've seen. The young man was an honor graduate from an art school where he won every prize in

pastel work besides doing excellent work in oils and water colors. Yet the sailor who examined him pronounced this subject to be so color blind that he questioned the wisdom of permitting a re-examination.

The second problem, that of improving visual acuity without and with the aid of glasses is one which is attracting much genuine attention and interest as well as criticism.

Aside from cases of amblyopia ex-anopsia and ciliary spasm (pseudo-myopia) very few ophthalmic practitioners attempt to add orthoptic training as a treatment for other types of cases of impaired sight in addition to merely prescribing glasses. Raukusen,[5] Peckham,[6] among a few others attempted to show rather successfully that many so-called "progressive" myopes may be made stationary or made to have normal vision with weaker minus correction. Raukusen, especially, had shown by actual clinical demonstration, that many myopes of long standing and fairly high degree were actually relative hyperopes. By using simple procedures, many of these were restored to emmetropia and some even to hypermetropia.

Fifty-eight muscle imbalance cases comprised the third and last of the visual training problems. From the clinical viewpoint and from the point of results this group presented the highest degree of accomplishment. The highest percentage of results have been attained with the heterophoria cases. The one drawback in training defective muscle balance is the time element. Exophorias take less time to correct than esophorias. Complicated cases, i.e., those of horizontal muscle defects associated with vertical muscle anomalies or with those of the accommodation are even more difficult. Heterotropias consume the most time.

In the group herewith presented were included cases of all types and degrees of anomaly and condition. (Tables 1 to 6.) Despite all this, the results attained were highly gratifying. One important accomplishment as a result of this study is an effective procedure by means of which the training time has been cut down considerably without sacrificing actual results.

TABULATION OF CASES. TABLE 1

1. The 368 defective vision cases herewith reported had the following types of ametropia:

| | Cases |
|---|---|
| (a) Amblyopia | 33 |
| (b) Compound Myopic Astigmatism | 134 |
| (c) Simple Hyperopic Astigmatism | 15 |
| (d) Simple Myopic Astigmatism | 9 |
| (e) Spasm of the Accommodation and Pseudo-Myopia | 76* |
| (f) Simple Hyperopia | 6 |
| (g) Compound Hyperopia Astigmatism | 24 |

(h) Simple Myopia ..... 57
(i) Mixed Astigmatism ..... 14

Of these, 246 patients had been wearing minus correction of some form. This is exclusive of the 33 amblyopia and mixed astigmatism cases. Many of the amblyopes had minus lens correction.

*Of these 76 patients, 30 had no glasses of any kind, the remainder had minus correction of some type.

TABULATION OF VISUAL ACUITY AS FOUND IN THE 368 DEFECTIVE VISION CASES. TABLE 2.

| Both Eyes | No. Cases | Each Eye | No. Cases | Each Eye | No. Cases |
|---|---|---|---|---|---|
| 20/400— | 12 | 20/20<br>20/50 | 1 | 20/80<br>20/30 | 2 |
| 20/300— | 2 | 20/50<br>20/70 | 4 | 20/25<br>20/40 | 6 |
| 20/200— | 25 | 20/60<br>20/100 | 3 | 6/200<br>4/200 | 1 |
| 20/100— | 8 | 20/60<br>20/20 | 4 | 20/300<br>20/400 | 6 |
| 20/150— | 2 | 20/300<br>20/40 | 2 | 20/200<br>20/25 | 1 |
| 20/80— | 4 | 20/200<br>20/400 | 5 | 20/60<br>20/40 | 3 |
| 20/70— | 3 | 20/25<br>20/70 | 2 | 20/20<br>20/40 | 6 |
| 20/60— | 8 | 5/200<br>3/200 | 1 | 18/400<br>20/400 | 2 |
| 20/50 | 7 | 20/70<br>20/100 | 2 | 20/30<br>20/400 | 3 |
| 20/40 | 16 | 20/40<br>20/30 | 14 | 20/100<br>20/80 | 4 |
| 20/30 | 12 | 20/25<br>20/30 | 12 | 20/50<br>20/60 | 5 |
| 20/25 | 14 | 20/30<br>20/20 | 6 | 20/60<br>20/80 | 4 |
| | | 6/200 | 1 | 20/100<br>20/200 | 5 |
| | | 20/100<br>20/50 | 3 | 17/200<br>20/200 | 1 |
| | | 20/50<br>20/30 | 7 | 20/60<br>20/70 | 4 |
| | | 20/80<br>20/300 | 2 | 20/70<br>20/30 | 2 |
| | | 20/70<br>20/300 | 1 | 20/60<br>20/300 | 2 |
| | | 20/25<br>20/20 | 6 | 20/50<br>20/300 | 1 |

| Both Eyes | No. Cases | Each Eye | No. Cases | Each Eye | No. Cases |
|---|---|---|---|---|---|
| | | 20/150<br>20/300 | 1 | 20/80<br>20/50 | 3 |
| | | 20/100<br>20/70 | 3 | 20/80<br>20/20 | 2 |
| | | 20/60<br>20/30 | 5 | 20/100<br>20/400 | 2 |
| | | 20/200<br>20/25 | 1 | 20/60<br>20/50 | 7 |
| | | 20/400<br>8/200 | 1 | 12/200 | 1 |
| | | 20/40<br>20/50 | 10 | 20/70<br>20/200 | 1 |
| | | 20/200<br>20/20 | 3 | 20/400<br>20/50 | 1 |
| | | 20/200<br>20/50 | 3 | 20/80<br>20/200 | 2 |
| | | 20/60<br>20/70 | 4 | 20/25<br>20/50 | 3 |
| | | 20/20<br>20/40 | 4 | 20/15<br>20/25 | 1 |
| | | 20/60<br>20/25 | 3 | 20/200<br>20/60 | 3 |
| | | 20/80<br>20/70 | 9 | 20/70<br>20/40 | 4 |
| | | 20/20<br>20/50 | 8 | | |

The following tables present a summary of the results obtained by means of these techniques.

GENERAL RESULTS. TABLE 3.

| | |
|---|---|
| Number of Defective Vision Cases Examined | 368 |
| Still Under Treatment, Sept., 1943, at time this report was started | 21 |
| Number Undergoing Treatment | 297 |
| Number Passed Subsequent Tests | 225 |
| Number Dropped Out | 104 |
| Number Failed to Pass Subsequent Test for Desired Services | 19* |
| Number Told That Visual Acuity Could Not Be Improved as Desired | 35 |

*Applicants for the following military services: Marine Corps Reserve 1; Glider Pilot training 2; V12 Naval Reserve 10; V7 Naval Reserve 2; Army Air Corps 1; Navy Air Corps 2, of these, both passed the visual tests for the Navy Air Corps but were rejected because the examiners believed the improvement shown by the candidates was only temporary. In each of these two cases the candidate indicated a need for weak minus spheres under cycloplegic examination; Coast Guard Academy 1.

CASES WITH LOW DISCRIMINATION OF COLOR TREATED. TABLE 4.

| | |
|---|---|
| Total cases treated | 127 |
| Cases still under treatment | 4 |
| Cases which passed subsequent tests | 63† |
| Number dropped out | 40 |

| | |
|---|---|
| Cases finished but outcome unreported | 4 |
| Cases treated despite advice given patient against training | 14 |
| Cases treated and who failed in passing subsequent military visual examination | 2* |

*One of these patients managed later to pass the visual tests for Glider Pilot Service. The other was not permitted to repeat the visual examination by the examining physician who had originally disqualified him.

†Of this total, 10 cases had both color and visual acuity defects, 1 case was treated for both muscular and color defects, and 1 case was treated for both visual acuity and color defect and subsequently passed his color tests but failed in his visual acuity tests.

ORTHOPTIC TRAINING FOR MUSCULAR ANOMALIES. TABLE 5.

| | |
|---|---|
| Total cases treated | 58* |
| Cases still under treatment | 9 |
| Completed cases who passed subsequent tests | 27† |
| Total cases completing treatment | 31 |
| Number dropped out | 17 |
| Cases treated despite advice given against training | 1 |

†Part of the total of 31 cases who completed their training.

*These cases included the following anomalies, Esophores 16, Esotropes 6, Exophores 22, Exotropes 8, and compound muscular abnormalties 6.

COMPARATIVE VISUAL ACUITY MEASUREMENTS. TABLE 6.

| | |
|---|---|
| $\frac{1}{20} = 20/400$ | $\frac{11}{20} = 20/36$ |
| $\frac{2}{20} = 20/200$ | $\frac{12}{20} = 20/33$ |
| $\frac{3}{20} = 20/133$ | $\frac{13}{20} = 20/30$ |
| $\frac{4}{20} = 20/100$ | $\frac{14}{20} = 20/28$ |
| $\frac{5}{20} = 20/80$ | $\frac{15}{20} = 20/27$ |
| $\frac{6}{20} = 20/70$ | $\frac{16}{20} = 20/25$ |
| $\frac{7}{20} = 20/60$ | $\frac{17}{20} = 20/23$ |
| $\frac{8}{20} = 20/50$ | $\frac{18}{20} = 20/22$ |
| $\frac{9}{20} = 20/44$ | $\frac{19}{20} = 20/21$ |
| $\frac{10}{20} = 20/40$ | $\frac{20}{20} = 20/20$ |

## METHODS OF EXAMINATION

### *A. Visual and Muscular*

Routine refraction tests were done in all cases except those with color vision defects. These were given visual and muscle balance tests only and if any abnormality was found advice was given for its amelioration. Patients with visual muscular defects were given an examination consisting of the following steps:

1. Name, age, occupation, complaint.
2. Case history, past and present; ocular, health, occupational, family, etc.
3. Visual acuity—naked and with old correction.
4. Muscle balance and convergence amplitude tests with and without glasses: P. R. and P. P.
5. Fundi, media, examination of the external eyes and their motility: pupils, lids, etc.
6. Keratometry.
7. Static skiametry.
8. Dynamic skiametry.
9. Subjective examination done with fogging lenses in all cases.
10. Muscle balance with new correction (vertical and horizontal).
11. Ductions and reserves.
12. Accommodation amplitude and reserves tests.
13. Convergence amplitude with new correction.
14. Near point muscle balance.
15. Cross cylinder tests—distance and near; binocular and by dissociation.
16. Visual acuity tests at near point.
17. Duction tests at near point:
    (a) Positive fusion reserve.
    (b) Negative fusion reserve.
18. Tests for retinal correspondence—after image and tangent cross.
19. Tests for spatial perception.
20. Distance and near point fusion tests.
21. Tests for stereopsis.
22. Visual field tests—if indicated.
23. Tests to determine possibility for correction.

After such an examination, it is fair to assume that a complete picture of the ocular condition is obtained. Step 23 was carried out at the

conclusion of the examination in all the three types of cases. It served as a prognosis for the possible outcome of a case. If no improvement, however slight, was apparent after the treatment following the examination, the patient was usually advised against continuing. This post-examination treatment is seldom lengthy; usually fifteen to twenty minutes and a rest period of about fifteen minutes, after which a check-up test is made. Visual debility cases often show an improvement of between one and three lines, Snellen, each eye; muscle cases invariably report greater ease of retaining fixation and the color vision defective can name plates, colors and shades previously missed or misread altogether.

Testing visual acuity was done on the American Optical Co. project-o-chart, in a darkened room nineteen feet long. This was further checked on cardboard Snellen charts hanging on a wall and illuminated by two 100 watt daylight bulbs in aluminum reflectors, the lamps placed at about four feet from the charts. Visual acuity recordings included the type of test apparatus used thus:

| | |
|---|---|
| V. A. without Rx: Project-o-chart | Distance<br>Size letter |
| V. A. without Rx: Wall chart | Distance<br>Size letter |

All visual acuity measurements will be thus recorded in this paper. It is imperative that the readings on the various charts tally.

The Maddox-Rod, the displacing prism test and the Stevens Phorometer were the instruments used for producing binocular dissociation. The Risley Rotary prisms were used for measuring the amount, and the synoptoscope, perimeter, Maddox tangent cross, were used for determining the degree of deviation.

The type of fusion, stereopsis, prevalence of suppression and quality of the binocular function in general were examined on the Keystone Telebinocular with Keystone charts. Projection and fixation habits were tested by having the patient point with the index finger behind an inch long pencil line on a small card held at about an arm's length, the affected eye fixating the line.[7] Pin-point holes at each end of the line indicated to the examiner the accuracy of projection. Tests were made to determine saccadic movements of the eyes and their commitancy, also the presence of diplopia in the entire field of fixation. While some of the tests mentioned may seem superfluous, I consider them all important. The purpose of these tests is to obtain as much information relevant to the case as possible. It helps toward better understanding and con-

sequently toward obtaining better, quicker and more lasting results.

*B. Color Vision*

The examination for color vision is divided into three distinct parts. (1) Recognition and differentiation at 20 feet, projected spots of colored lights under varying degrees of light intensity, from highest luminosity to the threshold of visibility. This is repeated under similar light conditions, maximum and minimum, by mixing the projected colored light spots respectively with red and green filters. In addition, smoke and amber filters are used to further reduce luminosity and to change shade values. To make test more difficult, it is repeated in a brightly lighted room with the colors projected at the luminosity threshold on an aluminum colored screen. The illumination of the projector is reduced by a rheostat. Supplementary smoke filters are used to further decrease visibility.

(2) Differentiating, assorting and naming Holmgren skeins, colored papers and colored marbles.

(3) Pseudo-Isochromatic, Ishihara and Stillings test plates. All tests were done in the order given.

A complete record is kept of the patient's ability at recognizing projected colors, the Holmgren yarns, colored objects, and Peusdo-Isochromatic plates. For the last named test the following record is kept.*

COLOR TEST A. O. CO. PSEUDO-ISOCHROMATIC PLATES

| Plate | Name Content | Seen As | Plate | Content | Seen As | Plate | Date Content | Seen As |
|---|---|---|---|---|---|---|---|---|
| | 89 | | | 25 | | | Design** | |
| 1 | 43 | | 9 | 68 | | 17 | Design | |
| | 56 | | | 5 | | | 2 Trace- | |
| 2 | 27 | | 10 | 3 | | 18 | able Designs | |
| | 8 | | | 97 | | | 052 | |
| 3 | 6 | | 11 | 34 | | 19 | 394 | |
| | 39 | | | 56 | | | 23 | |
| 4 | 42 | | 12 | 27 | | 20 | 65 | |
| | 56 | | | 12 | | | 15 | |
| 5 | 27 | | 13 | H | | 21 | 74 | |
| | 29 | | | 89 | | | 47 | |
| 6 | 57 | | 14 | 43 | | 22 | 98 | |
| | 86 | | | 86 | | | Design | |
| 7 | 75 | | 15 | 75 | | 23 | T. Design | |
| | 7 | | | 52 | | | | |
| 8 | 9 | | 16 | 96 | | | | |

*Errors are marked in red. Time required for reading plate is invariably recorded.
**Designs are marked "D"; when traced, "Dt." If not seen as designs, the characters seen are recorded, otherwise the words "nothing or none."

Aside from their diagnostic value, these tests also pre-determine the possible outcome of a case. The patient's aptitude in naming the projected colors and mixed shades and his ability to differentiate them indicate the degree of the anomaly. Experience has taught the writer to rely upon the determination of colors at the visibility threshold for the prognosis of a case. Ability to do so at threshold of luminosity is a favorable sign.

## CORRECTIVE PROCEDURES

### Visual Defects:

1. *Amblyopia and the Extra Ocular Muscles*

For visual defects which were definitely diagnosed as amblyopia-ex-anopsia, the basic training procedure consisted of putting the affected eye to work. The first step which I found most effective was to stimulate the eye with light in an effort to establish a path of conduction from it to the visual centers in the brain in an attempt to eliminate suppression. This was followed and supplemented with macular fixation and projection training, near point and distance visual training. Repetition, persistence and patience seemed to produce results. I found by experience that lengthy and frequent training periods were most effective. Hourly visits are not considered too lengthy or daily visits too frequent. This seems to produce most satisfactory results in a relatively shorter period of time. In addition home training consisting of using the affected eye in accordance with a pre-arranged procedure was advised. All this accounted for the speedy and highly successful results obtained. The following observation has served me as a rule and was followed in all amblyopia and muscle training cases: *Rate of Response (Improvement) is Directly Dependent Upon Intensity of Treatment.*

Training of heterophorias called for a simpler procedure than for heterotropias. Innervational stimulation by means of calisthenics, base-in, for esophorias, base-out for exophorias; base-up and down for hyperphorias was the usual first-stage and the most important step in the training procedure. Development of the accommodation amplitude and reserves when such training was indicated, was usually given in conjunction with calisthenics by adding minus spheres to the calisthenic training media.

Duction, fusion and stereopsis training were all given either simultaneously or each was given separately, depending on the case. The heterophorias responded to training of the proper type rather quickly. An

average of ten treatments was required for each case in the group reported in this paper.

The corrective procedure in strabismus was more extensive and therefore required a great deal more time. Before attempting to establish binocular co-ordination, monocular reconditioning had to be done. This meant improving the perceptual functions of the affected eye and making that organ ready for the coordination task which it was about to perform. Very frequently amblyopia and all the attendant anomalies were encountered, which had first to be eliminated. My program in all such cases consisted of two parts: (1) Developing the visual perception function (2) Developing the binocular co-ordination function. The complete treatment employed in such cases was a combination of the amblyopia training procedure with a more intense muscle training program. The co-ordination part of this program differed from the one for heterophoria in that two preliminary steps were added. These linked the perception development phase with that of the binocular co-ordination. These steps are:

1. Monocular and simultaneous binocular fixation training.
2. Superimposition (first degree fusion) training.

The manifestation of diplopia in the course of the preliminary training was regarded as a favorable sign. It indicated that suppression had become eliminated and that binocular perception was becoming manifested. More intense development of all the visual functions was the rule in heterotropias, hence the longer time consumed for treating patients of this type. Orthoptists know that the elimination of amblyopia and the subsequent development of visual acuity and the ultimate bringing of the two eyes into use as a single unit is a painfully slow process, often requiring many months of training of the most intensive kind.

2. *Improving Visual Acuity in Myopia*

The procedure used for improving visual acuity of myopes consisted of several steps dependent largely upon conditions of the case in question. The basic principle, however, was to induce relaxation of the accommodation and convergence. Should the case be one of pseudomyopia, this procedure tended to relieve the simulated myopia and make the eye emmetropic, or at least to bring out the true ametropia, which may be anything but myopia. However, in cases of true myopia, the relaxation procedure tended in most cases to improve (with corrected lenses), visual acuity. In many instances such improvement has been considerable, two or more lines on the Snellen test charts, without

recourse to squinting. Yet despite all this, very few cases showed changes in the refractive condition of the eyes, or needed weaker minus correction. However most of those who showed need for stronger minus correction in order to attain 20/20 visual acuity were able to do so with their old glasses unchanged.

In low and moderate myopias, either simple or compound, that is, up to about three diopters, the treatment procedure consisted of training on the Keystone Tele-Eye Trainer, or on the Wottring Rotoscope. Convex spherical lenses varying from + .50 D. to + 2.00 D. O. U. were used to produce relaxation of the accommodation. Similar fixation targets were used for each eye. With the Rotoscope, targets No. 27 or No. 29 at infinity were used. Each one was fully illuminated and was flashed on monocularly in alternate sequences. The targets remained stationary and separated to produce the maximum base-in prism effect at the far point.

Selecting the mode of training, the instruments and the supplementary convex lenses depended upon the individual case. In some instances plus lenses were not used at all and targets No. 27 only were used, whereas in other cases, targets No. 29 were seen with considerable ease with + 1.50 sphere in each eye. On the Tele-Eye Trainer stereograms, PG series VA2, and EC series base-in were used. The visual acuity training cards (VA2) contain either complete words or numerals placed stereoscopically at distances so designed as to equal the Snellen notation at given distances. Thus the visual acuity can be determined by what is read when the card holder is at the infinity mark.

This series of cards was used mostly for monocular visual acuity training and for improving clarity, speed and range of monocular perception. Each eye was trained separately. The No. 3 rotor was used in most instances. When longer perception range was desired, No. 4 rotor was used monocularly. Rotors No. ½ and No. 1 were used for training and developing recognition speed. Keystone DE 21, 41, 61 word orientation cards were used mainly. After this was accomplished, the eye comfort series base-in were used. The cards favored mostly are Keystone View Co. base-in series EC 108 & 109.

108—fusing the two upper pictures requires 7△ divergence
fusing the two lower pictures requires 12△ divergence

109—fusing the two upper pictures requires 14△ divergence
fusing the two lower pictures requires 19△ divergence

Unlike the VA 2 series cards, the EC series were used binocularly. The same rotors No. 3 and No. 4 were used but they were set to flash on

simultaneously with the illumination at its maximum. The object was to fuse the upper two pictures and then change the focus of fixation to fuse the lower two pictures. Thus changing of fixation while maintaining and enhancing clarity of the stereoscopic pictures is the primary object of this treatment. As this is accomplished, plus spheres are used to fog the pictures which the patient is required to clear up by repeated fixation. Often the added plus not only tended to reduce the visual perception but it also disrupted fusion at the points of divergence (relaxation). Persistent training, however, rectified this satisfactorily.

Fusing the two sets of pictures on the EC 109 base-in card is usually a sign of best attainment, and, as had been consistently observed in the course of this work, the easier the relaxation of accommodation-convergence, the better the naked visual acuity became.

In most cases the procedures described were adequate to bring about desired results. However, some seemingly easy cases, while showing improvement following the first treatment, remained unchanged and no further improvement was possible after that. Then there were cases which by all indications should have responded to treatment but failed to respond at all. Some of these comprised the group which was advised against treatment. Nevertheless a few persisted despite such advice and have made remarkable improvement and later passed the visual tests for their desired branches of military service.

In these cases and many others, supplementary training procedures had to be devised as the occasion demanded. In their early stages of training many subjects were treated as if they had amblyopia-ex-anopsia. As perception became improved the procedures were changed to those described.

A variation from the procedures described is one advocated by Rakusen[5] which was found quite effective in the more stubborn cases. O. U. + 2.00 sphere combined with 20△ base-in prism are used. The patient is sitting at his furthest point where the 200 foot letter on a Snellen test chart is visible. He is seeing two blurred charts which are illuminated intermittently with a 100 watt daylight bulb. The light is set to flash at regular intervals. The patient is to try to see and read as much as possible with each eye without straining or effort. Distance from the chart is increased until he can see equally or nearly as well with each eye separately at the furthest possible point. This procedure invariably helped to improve vision in many cases which failed to respond to the other methods.

Plus spherical lenses especially for near were used rather freely.

Their value in preventing strain induced by extensive near use of the eyes, especially in hyperopia is well recognized. That the myope also is subject to a form of eyestrain (without apparent symptoms of asthenopia) which becomes manifested in impaired visual acuity at distance (although it is induced by concentrated near work especially when glasses are worn), must be recognized. Plus spheres for near use it was found tended to relieve such strain. Those who used them diligently (some wore them constantly in fitover frames over their regular glasses) showed marked retention of their visual improvement even after extreme use of the eyes at near.

The near lenses used varied from + 50 D. sphere to + 3.00 D. sphere. Fitover frames were used in most cases. Some, however, preferred separate glasses for near use only.

### 3. TRAINING COLOR PERCEPTION

Few anomalies of vision have evoked as much interest and controversy as has color blindness. In a recent symposium on the subject conducted for the Optical Society of America and reported in the Society's Journal[9], various aspects of the problem were discussed. It is known and generally accepted that true color blindness, or dischromatopia, is an hereditary anomaly and is incurable.

Trichromatic vision is normal color vision and is characterized by the ability to recognize or to match an infinite variety of colors (hues, intensities, tints, shades and saturations) produced by the mixing of the three primary colors: red, green and blue.

There are many varieties of color blindness ranging from total dyschromatopia to mere ignorance of colors and tints. Some of these color vision defects are uncorrectable; some (and they comprise a surprisingly large percentage) were found to be amenable to reconditioning by proper training.

Acquired color blindness may follow injury or disease of the optic nerve or brain. It is one of the symptoms of toxic amblyopia and is an apparent manifestation in injuries to the occipital lobe of the brain. [8 12]

The training procedure found most effective and the one used in the reconditioning of the cases reported is essentially and basically one of re-education. It is divided into four parts: (1) Explanation of the purpose of tests, reason for the way plates are constructed as they are; how the plate contents tend to emulate natural conditions of terrain, fog,

vegetation, under most difficult conditions. (2) Teaching color recognition by actual use of colored objects; sorting and naming similar colored papers of different shades; mixing these and regrouping them while accurately naming each shade has been found to be quite effective; sorting clear colored glass marbles and naming them is another highly valuable color training exercise. The marbles, obtained at the 5 and 10 cent store have the following colors and shades: red, dark green, dark amber, dark blue, white, light blue, pink, light amber, olive green, and light green. Because of their spherical shape, high reflectibility and absorptive quality, these marbles constitute quite a difficult exercise, which, when mastered, seems to help in the more advanced work ahead, which constitutes part (3) of the re-education procedure—that of seeing the contents of the test plates and reading them speedily and accurately.

For this part of the procedure, Pseudo-Isochromatic plates are used. The patient is asked to read whatever he can on the plates without tracing and to trace and name all others. No attention is paid to the length of time required for the task. All effort is directed toward developing accurate perception of colors and plate content. Repetition tends to intensify this function and also to develop speed in recognition. This, coupled with the earlier two steps in the procedure, seems to intensify learning and retention of color recognition.

Step (4) consists entirely of testing, checking and guarding against memorizing and malingering. Testing is done with the aid of a stop watch to determine speed of recognition. The testing apparatus consists of the projected spots of colored lights, as used in preliminary testing, only this time the tests are done both at the threshold of luminosity, with and without supplementary smoke and amber filters and at the highest degree of illuminosity permitted under the circumstances. The room is illuminated with a 1.50 watt bulb in an indirect fixture, with an additional overhead 60 watt bulb in the upright of the chair. The blinds in the room are fully drawn. The luminosity of the projector is reduced to a minimum and readings are taken. This is followed by using the various Pseudo-Isochromatic plates (Ishihara, Stillings, and A. O. Edition). All tests are repeatedly made both for speed and accuracy. Precaution is taken to eliminate any attempt at memorizing. No sequence of plates is followed. They are exposed at random and for short periods of time. This is followed by splitting up plates, exposing one at a time or halves of two separate plates. All effort is directed toward teaching easy color recognition, the discrimination of shades and the actual and permanent retention of the function.

CASE REPORTS:

In presenting the following group of cases, only a relatively small portion of those treated is cited. These were chosen because they represent the types most commonly encountered and constitute a sort of cross-section.

All patients were subjected to a complete examination as outlined at the beginning of this report. But to detail all the findings in each report would seem unnecessary and too lengthy. Hence, only the most pertinent data in condensed form is given. The most important factors recorded are:

1. Naked Visual Acuity.
2. Visual Acuity with old correction and its record (if available).
3. Visual Acuity with new correction and a record of prescription.
4. Phorias with and without any glasses and with new glasses.
5. Visual Acuity following treatments and number of treatments required.
6. Branch of Military Service entered.

No. 1432. Mr. J. J. L. Age 27. Flight Instructor C. A. A. Was about to enter active service. Naked V. A. — O. D. 20/50-1; O. S. 20/20—Low Exophoria c & s Rx; P. R. & P. P. Ductions normal; fundi normal. After four one-hourly training periods: Naked V. A. O. D. 20/25 +. Had: O. D. — .75 cyl. × 180 = 20/30-2. O. S. + .75 cyl. × 90 = 20/20. With new Rx: O. D. + .50 ⌒ + 1.25 × 90 = 20/20 —. O. S. + .62 ⌒ + .25 × 90 = 20/20 —. Discontinued treatment without advising me as to outcome.

No. 1331. Mr. R. A. L. Age 32. Sales Engineer. This patient failed vision test Naval Reserve enlistment. Naked V. A. O. D. 20/50—1; O. S. 20/50—1. P. R. orthophoria; P. P. 3△ exophoria; fundi normal. Had no glasses. Needed: O. D.—.75 sph. = 20/20. O. S.—.75 ⌒ — .25 × 50 = 20/20. After four treatments over a period of three weeks, naked V. A. was: O. D. 20/15. O. S. 20/20. Had not as yet repeated naval eye examination at this writing.

No. 1320 Mr. G. K. L. Age 20. Student who had failed vision test Specialist's Corps Naval Reserve—Naked V. A.—O. U. 20/70—. Fundi normal. Needed: O. D. — 1.25 ⌒ — 1.25 × 90 = 20/30. O. S. — 1.25 ⌒ — 1.25 × 75 = 20/20. Phorias: without Rx: P. R. 1 △ eso. P. P. 9 △ exo. With Rex: P. R. 6 △ eso. P. P. 1 △ exo. Seven treatments given. On last one: Naked V. A. 12/20 each eye. Repeated examination, but misread "O" for "D"; and "E" for "F" and was disqualified.

No. 1370. Mr. J. R. L. Age 17. Student. This patient had failed vision test Navy Air Corps—had no glasses. Naked V. A. O. D. 20/20; O. S. 20/30. Phorias: P. R. 10 △ eso. P. P. 13 △ eso. Needed: O. D. + .75 sph. = 20/20 O. S. + .25 sph. ⌒ + 50 × 90 = 20/20. Phorias unchanged. P. R. ductions: Adduction: 36 △. Abduction: 8 △. No diplopia, or any complaints of asthenopia. After four treatments, naked V. A. 20/20 each eye. Passed military eye test.

No. 1402. Mr. R. S. L. Age 24. Naval Officer. This patient had obtained waiver on vision when enlisted. Due for promotion for which he needed better vision than he had. Naked V. A. O. D. 20/200—; O. S. 20/30—. Wearing: O. D. + 2.00 ⌒ + 3.25 × 90 = 20/100. O. S. + 50 ⌒ + 2.25 × 90 = 20/25. With this Rx: P. R. 3½ △ eso. P. P. 9 △ eso. Pinhole vision: O. D. 20/60—(s Rx had about 5° esotropia O. D.) Needed: O. D. +1.50 ⌒ + 3.25 × 90 = 20/60 + 2. O. S. + .50 ⌒ + 1.75 × 90 = 20/20. After three treatments: Naked V. A. was: O. D. 20/50 O. S. 20/20 same with new glasses. Patient was transferred to a different base and discontinued training.

No. 1254. Mr. R. E. L. Age 17. Student. He had failed vision test Army Air Corps. Had no glasses. Naked V. A. O. D. 20/40 + 3. (variable) O. S. 20/30 — 1. Needed: O. D. — .62 sph. = 20/20 O. S. — .50 sph. = 20/20 not prescribed. Phorias: c & s Rx: P. R. ½ △ exo. P. P. 3 △ exo. Three treatments were given over a period of one month. V A. was 18/20 each eye. Failed to pass repeat examination.

No. 1040. Mr. H. M. L. Age 23. Electrician. Patient had failed eye test for Navy enlistment. Naked V. A.—O. D. 20/40—. O. S. 20/30—. Wearing: O. D.—.75 ⌒ + 1.00 × 1.70 = 20/20—. O. S. —.75 ⌒ + 1.25 × 15 = 20/20—. Phorias: s Rx: P. R. ½ △ exo. P. P. 10 △ exo. c Rx: P. R. 1 △ exo. P. P. 12 △ exo. Needed: O. D. —.75 ⌒ + .50 × 180 = 20/20 O. S. — .50 ⌒ + .75 × 180 = 20/20. P. R. ortho. P. P. 9 △ exo. Given four treatments after which he repeated test successfully. Naked V. A. 20/20 each eye.

No. 1027. Mr. I. L. Age 22. Soldier. This patient wanted vision improved to pass eye test for army air corps. Naked V. A. O. D. 20/30— O. S. 20/30. Needed: O. D. + .50 ⌒ — 1.00 × 90 = 20/20. O. S. + .25 ⌒ — 1.50 × 65 = 20/20. Wearing: O. D. + .50 ⌒ — 1.00 × 180 = 20/20—. O. S. + .50 ⌒ — 1.25 × 60 = 20/25—.Phorias with Rx: P. R. ortho. P. P. 2 △ exo. Phorias s Rx: P. R. ortho. P. P. 4 △ exo. At the time of this examination the practice of cycloplegic refraction was prevalent in the Air Corps. This practice has since been discontinued. Moreover, astigmatism over .50 D was disqualifying. Mr.

L. was informed of this. Given in fitover frames to be worn over his glasses: O. D. + .50 sph. O. S. + .75 sph. Also treatment was contemplated but not given until Aug. 11, 1942. V. A. with and without glasses 20/20 each eye. Discontinued treatment.

No. 1241. Mr. G. C. L. Age 39. Salesmanager. He had failed vision test—Naval Reserve Corps with and without Rx. With and without Rx: Naked V. A.: O. D. 20/200. O. S. 20/200. Wearing: O. D. + 1.25 ⌒ — 3.25 × 173 = 20/30 — 1. O. S. + 1.25 ⌒ — 3.00 × 180 = 20/20 — 1. With Rx: P. R. ortho. P. P. 4 △ exo. Needed: O. D. + 2.00 ⌒ — 3.75 × 170. = 20/20. O. S. + 1.25 ⌒ — 3.50 × 180 = 20/20. Given two treatments: V. A. s Rx afterwards = O. D. 20/80. O. S. 20/70. Phorias unchanged. c old Rx. O. D. 20/20 — 2. O. S. 20/20 —. Discontinued training.

No. 1187. Mr. J. H. L. Age 21. Balancer. This patient wanted V. A. improved if possible to enable him to get into any branch of Air Corps. Hadn't as yet taken any tests. Naked V. A.: O. D. 20/400. O. S. 20/30. Had: O. D. + 2.00 sph. = 20/400. O. S. + .25 ⌒ + .25 × 90 = 20/20—. Needed: O. D. + 1.00 ⌒ + 1.25 × 90 = 20/300. O. S. + .75 cyl. × 90 = 20/20. Given one visual training exercise. Naked V. A. after that was: O. D. 20/200. O. S. 20/20. Patient was told that it would be a very lengthy procedure and that his chances for getting into the desired branch of service were doubtful.

No. 1154. Miss B. E. L. Age 27. Stenographer. Wanted Naked V. A. improved to enable her to join one of the services. Naked V. A.: O. D. 20/400 — barely saw outline O. S. 20/400. Had: O. D. — 3.75 ⌒ — .75 × 75 = 20/25. O. S. — 2.75 ⌒ — .25 × 105 — 20/20 — 2, c Rx: P. R. ortho. P. P. 4 △ exo. Needed: O. D. — 400 ⌒ — .75 × 90 = 20/20. O. S. — 2.50 ⌒ — .25 × 180 = 20/20. c Rx: P. R. ortho. P. P. 1 △ exo. Naked V. A. after 3 training periods: O. D. 20/200. O. S. 20/100. Checked V. A. after three weeks. It remained unchanged.

No. 1372. Mr. G. T. M. Age 41. Mathematics teacher. Wanted V. A. improved to enable him to apply for commission in Naval Reserve. Naked V. A.: O. D. 20/25 — 1. O. S. 20/40. Had: O. D. + 1.25 ⌒ + .75 × 90 = 20/20. O. S. + 1.25 ⌒ + 1.00 × 90 = 20/20. An addition O. U. + 1.00 sph. made near point reading much more comfortable and clear. Three treatments improved naked V. A. to: O. D. 20/20; O. S. 20/20 — 3. Mr. M. passed eye test but was disqualified for other reasons.

No. 1290. Mr. G. C. M. Age 17. Defense worker. Failed eye

examination Army Air Corps and Marines. Naked V. A.: O. D. 20/200. O. S. 20/100 —. Had: O. U. — 2.25 sph. = 20/20 each eye. With Rx: P. R. ortho. P. P. 8 △ eso. Needed: O. D. — 1.50 ⌒ — .25 × 90 = 20/20. O. S. — 1.00 ⌒ — .25 × 90 = 20/20. Phorias with this Rx: P. R. ortho. P. P. 4 △ eso. Without Rx: P. R. ortho. P. P. 2 △ exo. Given two treatments after which naked V. A. was: O. D. 20/70 +. — (squinting made V. A. worse) O. S. 20/60 — 1. Patient told to give up idea of getting into air corps.

No. 1266. Mr. N. M. Age 23. Cost Analyst. Patient had failed eye test Naval Reserve. Naked V. A.: O. D. 20/30. O. S. 20/30 — 1. Had: O. D. — 1.75 cyl. × 180 = 20/25 — 1. O. S. — 2.75 cyl. × 180 = 20/25. Needed: O. D. — 4.50 cyl. × 180 = 20/20. O. S. — 5.00 cyl. × 180 = 20/20. Phorias: c Rx: P. R. 1 △ eso. P. P. 6 △ eso. s Rx: P. R. 2 △ eso. P. P. 1 △ eso. After six treatments, Mr. M. passed visual tests for naval reserve. Naked V. A.: O. D. 17/20. O. S. 16/20. c Rx: 20/20 O. U.

No. 1263. Mr. J. F. M. Age 17. Student. Planning to join Army Air Corps. Would like naked V. A. improved to enable him to pass test. Naked V. A. — O. D. 20/70 — 1. O. S. 20/50. Had: O. D. — 1.00 ⌒ — .25 × 75 = 20/20. O. S. — .62 sph. = 20/20. Phorias s Rx: P. R. 2 △ eso. P. P. 2½ △ eso. Phorias c Rx: P. R. 3 △ eso. P. P. 7△ eso. Given brief treatment after which naked V. A. was: O. D. 20/40. O. S. 20/50. Patient did not continue treatment.

No. 1171. Mr. A. D. M. Age 17. Squad clerk. Wanted naked vision improved to 20/100 each eye to enable him to pass eye test for Army Air Corps ground crew. Had: O. D. — 2.00 ⌒ — .50 × 180 = 20/25. O. S. — 3.25 sph. = 20/20. Naked V. A.: O. D. 20/200. O. S. 20/400. c P. R. ortho. P. P. ½ △ eso. s ortho. 7 △ exo. Needed: O. D. — 2.25 ⌒ — .50 × 180 = 20/20. O. S. — 3.25 sph. = 20/20. Four treatments improved naked vision to: O. D. 20/50; O. S. 20/70 —. Six weeks later passed test for Air Corps Ground Officers Training School.

No. 1262. Mr. E. M. B. Age 19. Student. Patient failed vision test V12 Naval Reserve. Naked V. A.: O. D. 20/50 + 2. O. S. 20/25 —. Needed: 18/20 each eye correctible to 20/20 each. Had: O. U. — 1.00 sph. = 20/20 each eye. Needed O. U. — .50 sph. = 20/20. After three treatments had: 18/20 each eye. Took test but was rejected. He read as required but was too slow in doing it.

No. 1318. Mr. R. B. Age 17. Student, who had failed the vision test of the V12 Naval Reserve (had 11/20 each there) needed 18/20

each eye contemplated joining air corps. Needed: O. D. — 62 ⌒ — .25 × 180 = 20/20. O. S. — .75 ⌒ — .25 × 180 = 20/20. Naked V. A.: O. D. 20/30 — 1. O. S. 20/40. Had glasses for near only + .50 sph. With this Rx, phorias: P. R. 1 △ exo. P. P. 8 △ exo. With new Rx: phorias: P. R. 1 △ eso. P. P. ortho. No change of glasses was made. Patient made very little progress after post examination treatment. He was advised against trying air corps, although vision was improved to 20/30 each eye. It was not constant.

No. 1135. Mr. M. C. Age 19. Student. Patient planning to enlist in R. C. A. F. for which he needed 20/60 minimum naked V. A. correctible to 20/20 each. Naked V. A.: O. D. 20/100. O. S. 20/80. Had. O. D. — 1.25 ⌒ — 1.00 × 165 = 20/20 — 1. O. S. — .75 ⌒ — 1.25 × 180 = 20/20. Phorias: c P. R. ortho. P. P. 5 △ exo. s ortho. 7△ exo. Needed: O. D. — 1.25 ⌒ — 1.00 × 170 = 20/20. O. S. — .75 ⌒ — 1.00 × 180 = 20/20. Phorias: c P. R. ortho. P. P. 6 △ exo. Patient took 16 treatments, the first on Dec 7, 1942; the last one May 21, 1943. Naked V. A. eyes wide open: O. D. 20/50; O. S. 20/30 +.

No. 1203. Mr. J. M. C. Age 18. Student. Patient failed vision test Naval ROTC—VI. Naked V. A.: O. D. 20/20 —. O. S. 20/40. Phorias: P. R. ortho. P. P. ortho. Had no glasses. Needed: O. D. — .25 sph. = 20/20. O. S. — .75 sph. = 20/20. not prescribed. Given two treatments and for near use only O. U. + 1.50 sph. Passed eye test Naval ROTC. Naked V. A.: O. D. 20/20; O. S. 20/25 + 2.

No. 1332. Mr. L. D. Age 20. Student. Had expected to be called to active duty in Naval Reserves and disqualified because of defective naked vision. Naked V. A. O. D. 20/50. O. S. 20/20—. Had: O. D. — .50 ⌒ — .75 × 15 = 20/20 —. O. S. — .75 cyl. × 165 = 20/20 —. c P. R. 2 △ exo. P. P. 3 △ exo. Needed: O. D. — .75 ⌒ — .25 × 5 = 20/20. O. S. — .25 cyl. × 175 = 20/20. c P. R. 2 △ exo. P. P. 2 △ exo. Seven treatments were given over a period of five weeks. Passed eye test naked V. A. 20/20 each eye.

No. 1051. Mr. R. J. D. Age 19. Student. Patient had failed vision test Naval ROTC. Naked V. A. O. D. 20/70. O. S. 20/70—.Had: O. D. — 1.00 ⌒ — .25 × 15 = 20/20. O. S. — 1.00 ⌒ — .50 × 165 = 20/20. c P. R. 1½ △ eso. P. P. 4 △ eso. s P. R. 1 △ eso. P. P. 2 △ exo. Needed: O. D. — .50 sph. O. S. — .75 sph. 20/20. O. U. Add + 150 sph. O. U. c P. R. ortho P. P. 4 △ eso. Ten treatments given over a period of two months; passed test; V. A. O. D. 18/20; O. S. 12/20.

No. 1226. Miss F. D. Age 21. Secretary. This patient had failed vision test given by the WACS. Naked V. A.: O. D. 20/400. O. S. 20/400. Had: O. D. — 3.25 ⌒ — .25 × 10 = 20/25. O. S. — 3.75 ⌒ — .25 × 170 = 20/25. c P. R. 1 △ exo. P. P. 4 △ exo. Needed: O. D. — 3.25 ⌒ — .50 × 10 = 20/20. O. S. — 4.00 ⌒ — .25 × 170 = 20/20. Phorias unchanged. Passed eye test after two treatments — 20/200 each eye.

No. 1351. Mr. R. J. F. Age 23. Shipfitter. This patient had failed vision eye test given by Army Air Corps. Naked V. A.: O. D. 20/25. O. S. 20/25 —. Had: O. D. × .25 ⌒ — .25 × 120 = 20/20 —. O. S. + .50 ⌒ + .50 × 60 = 20/20 —. c P. R. ortho P. P. 3 △ exo. s P. R. 1 △ eso. P. P. 4 △ exo. Needed: O. D. + .25 ⌒ + .50 × 120 = 20/20. O. S. + .25 ⌒ + .50 × 60 = 20/20. Rx. not changed. Defective stereopsis. Eight treatments given. Visits extended over a period of three months. Passed eye test 20/20 each eye, also flight physical examination.

No. 1413. Mr. D. A. F. Age 23. Lawyer. He had planned to take examination for government position. Naked V. A. O. D. 20/20 —. O. S. 20/200. Had: O. D. — .25 ⌒ — .25 × 180 = 20/20. O. S. — 1.75 ⌒ — .25 × 180 = 20/20. c P. R. 2 △ exo. P. P. 1 △ exo. Needed: O. D. — .25 ⌒ — .25 × 90 = 20/20. O. S. — 1.25 ⌒ — .25 × 90 = 20/20. Add O. U. + 1.75 sph. for near. Given eleven treatments. Naked V. A. at conclusion: O. D. 20/20. O. S. 20/70, eyes wide open. When squinting. O. S. 20/30 + 2.

No. 1354. Mr. P. H. F. Age 17. Student. Patient had failed vision test West Point and Army Air Corps. Had no glasses. Was told vision couldn't be improved with them. Naked V. A.: O. D. 20/40. O. S. 20/40. P. R. 1 △ exo. P. P. 4 △ exo. Needed: O. U. + .50 cyl. × 90 = V. A. variable and inconstant. Given six treatments. Passed V. A. test 20/20 each eye Army Air Corps. Phorias: c Rx: P. R. 1 △ exo. P. P. 2 △ exo. Prescribed: O. D. + .37 cyl. × 90 = 20/20. O. S. + .37 cyl. × 90 = 20/20. Add O. U. + 1.00 sph. for near use.

No. 1193. Mr. L. F. Age 26. Newspaperman who had failed vision test for the Naval Reserve but was given waiver to 6/20 worse eye. Naked V. A.: O. D. 20/30. O. S. 20/400 (squinting made vision more blurred) Had: O. D. — .75 ⌒ — .25 × 180 = 20/20. O. S. — 1.75 ⌒ — .25 × 90 = 20/20. c P. R. 5 △ exo. P. P. 18 △ exo. s Rx: same. Glasses not changed. Five treatments given. Passed eye test. Naked V. A. O. D. 20/20 — 1; O. S. 20/40.

No. 1186. Mr. P. L. F. Age 18. Failed vision test in the Marine

Enlisted Reserve & Air Corps. Had no glasses. Naked V. A. O. D. 20/20. O. S. 20/40. Phorias: P. R. 1½ △ exo. s P. P. 3 △ exo. Needed: O. D. — .50 cyl. × 75 = 20/20. O. S. — .50 sph. = 20/20. (not prescribed) Instead given O. U. + 25 sph. for constant use for duration of treatment. Also given treatment. On following day took test for Marine Corps and passed it 20/20 each eye.

No. 1279. Mr. W. E. G. Age 18. Student. Now expected to be drafted into army. Wanted to get into Naval Reserve instead. Vision inadequate. Naked V. A. O. D. 20/60. O. S. 20/80. Had: O. D. — .75 sph. = 20/30. O. S. — 1.00 sph. = 20/30. Phorias: c P. R. ortho. P. P. 3 △ exo. Needed: O. D. — 1.00 sph. = 20/20. O. S. — 1.00 ⌒ — .25 × 90 = 20/20. Phorias as with old Rx. Ten treatments given. Passed eye test Naval Reserve. Naked V. A. 12/20 each eye.

No. 1282. Mr. M. N. G. Age 17. Student. This patient had failed vision test V12, and Naval ROTC. Naked V. A. O. D. 20/20. O. S. 20/40 — 1. (pinhole 20/25). Had no glasses. Was told by eye specialists that glasses couldn't improve vision in left eye; told to cover right eye for half hour daily. Needed: O. D. + 1.25 ⌒ + .25 × 180 = 20/20. O. S. + 1.25 ⌒ + 1.50 × 180 = 20/20. c P. R. ortho. P. P. 2 △ exo. (treated as amblyopia ex-anopsia). s Rx. Phorias: P. R. 2 △ eso. P. P. ortho. Training program: (1) Retinal stimulation (light flashing to affected eye, the better eye being occluded). (2) Projection and macular fixation training. (3) V. A. training, Keystone V. A. 2 cards, Snellen charts, near point V. A. (4) Home training; using O. S. (O. D. occluded) tracing, reading, movies, etc. Ten treatments extending over a period of one month given. Passed eye test 20/20 each eye without glasses.

No. 1085. Mr. G. W. G. Age 19. Student. This patient had planned to enlist in one of the services, preferably Air Corps, Glider Corps, or Marine Corps Reserve. Naked V. A. O. D. 20/60. O. S. 20/50 —. s P. R. ½ △ exo. P. P. 3 △ exo. Had: O. D. — 1.00 sph. = 20/20. O. S. — 1.00 sph. = 20/20 — 1. c P R. ortho. P. P. 5 △ eso. Needed: O. D. — .75 ⌒ — .25 × 180 = 20/20. O. S. — .62 ⌒ — .25 × 180 = 20/20. c P. R. ortho. P. P. 1△ eso. also O. U. + 1.50 sph. for near. Seven treatments were given. Passed eye test Marine Corps Reserve; 18/20 +., each eye. Re-checked one month later, same V. A.

No. 1275. Mr. R. M. M. Age 17. Naval Reserve at College. Did not have required 18/20 naked V. A. for V12. Naked V. A. O. D. 20/30 —. O. S. 20/30 —. Had: O. U. — .75 ⌒ — .25 × 180 =

20/20. Phorias: c. P. R. 2 △ exo. P. P. 7 △ exo. s. P. R. 1 △ exo. P. P. 9 △ exo. Needed: O. D. — .50 ⌒ — .25 × 165 = 20/20 +. O. S. — .25 ⌒ — .25 × 5 = 20/20 +. Phorias: c P. R. 1 △ exo. P. P. 4 △ exo. Given three treatments. Naked V. A.: O. D. 20/20; O. S. 20/20. Passed eye test without glasses 20/20 each eye.

No. 1149. Mr. M. M. Age 32. Retail grocer. Patient was planning to join Naval Reserve but hadn't required visual acuity. (Might get commission on a waiver of 8/20 each eye, correctible to 20/20). Naked V. A. O. D. 20/70 — 1. O. S. 20/70 — 1. Had: O. D. + 400 ⌒ + .50 × 90 = 20/20. O. S. + 400 ⌒ + .50 × 90 = 20/20. c P. R. 2 △ eso. P. P. 1 △ eso. s P. R. 10 △ eso. P. P. 8 △ eso. Needed: O. D. + 4.75 ⌒ + .50 × 90 = 20/20. O. S. + 4.50 ⌒ + .50 × 90 = 20/20. c P. R. ortho. P. P. 1 △ eso. Two treatments were given. Naked V. A. afterward: O. D. 20/60 + 1: O. S. 20/60 + 3. Discontinued training.

No. 1251. Miss E. M. Age 30. Secretary. Failed Eye Test WACS. Naked V. A.: O. D. 20/400 —. (barely seeing outline) O. S. 20/400 —. Had: O. D. — .75 ⌒ — 2.75 + 180 = 20/50. O. S. — 1.75 ⌒ — 3.75 × 180 = 20/20. RX not changed. Phorias: c P. R. 1 △ exo. P. P. 6 △ exo. After two treatments, Miss M. passed eye test: O. D. 20/70; O. S. 20/100 —.

No. 1048. Mr. P. M. Age 25. Machinist. Contemplated enlisting in glider unit, army air service. Naked V. A.: O. D. 20/50 — 1. O. S. 20/60. Had: O. D. — 1.25 ⌒ — .25 × 125 = 20/20 — 1. O. S. —1.25 ⌒ — .25 × 20 = 20/20. Phorias: c, ortho P. R. s P. R. ortho. 6 △ eso. P. P. P. P. ortho. Needed: O. D. — 1.00 ⌒ — .50 × 130 = 20/20 +. O. S. — 1.00 ⌒ — .25 × 175 = 20/20 +. (Phorias as with old Rx.) Given five treatments over a period of a month when he took and passed eye examination for V. O. C. training. V. A. = O. D. 20/40; O. S. 20/30.

No. 1256. Mr. A. McA. Age 23. Medical student. Wanted to get into Naval Air Corps. Naked V. A.: O. D. 20/30 — 1. O. S. 20/30 — 1. Had: O. D. — .25 ⌒ — .50 × 90 = 20/20. O. S. — .50 ⌒ — .25 × 90 = 20/20. c P. R. ortho. P. P. 2 △ eso. s P. R. 1 △ exo. P. P. ortho. Needed: O. U. — .25 cyl. × 90 = 20/20 O. U. Mr. McA. was told of the prevailing practice at that time of examining all flying recruits with cycloplegia and that he may be disqualified if found myopic even though V. A. was 20/20. He took five treatments and passed eye examination for the Naval Reserve Corps, 18/20 each eye.

No. 1063. Mr. T. L. McM. Age 22. Student. Failed vision tests

for Naval and Coast Guard Reserves. Naked V. A.: O. D. 20/50 — 2. O. S. 20/50. Had: O. D. — .75 ⌒ — .50 × 180 = 20/20. O. S. — 1.00 ⌒ — .25 × 180 = 20/20. c P. R. ortho. P. P. Needed no change of correction. Given three treatments after which he passed eye test for Naval Reserves. Naked V. A. 15/20 each eye.

No. 1202. Mr. L. E. N. Age 19. Student. Failed Eye Test Naval ROTC. Naked V. A. O. D. 20/200. O. S. 20/200. Squinting: O. D. 20/70. O. S. 20/80. Had: O. D.—2.00 ⌒ — .50 × 5 = 20/20. O. S. — 2.75 ⌒ — .50 × 175 = 20/20. Phorias: c P. R. ortho. P. P. 2 △ exo. s. P. R. ortho. P. P. 11 △ exo. Needed: O. D. — 2.00 ⌒ — .50 × 180 = 20/20. O. S. — 2.25 ⌒ — .75 × 180 = 20/20. Phorias unchanged. Given 8 treatments. Naked V. A.: O. D. 12/20: O. S. 12/20. Mr. N. repeated eye test and passed it. He was re-examined 4 months later and naked V. A. remained unchanged.

No. 1291. Mr. R. P. O. Age 18. Student. This patient failed vision test V12 Naval Reserve. Naked V. A.: O. D. 20/40. O. S. 20/20 —. Had: O. D. — .75 sph. = 20/20. O. S. — .37 sph. = 20/20. c P. R. 8 △ eso. P. P. 7 △ eso. (same without any Rx or with additional + 1.00 sph. O. U.) Needed: O. D. — .25 sph. = 20/20 O. S. plano = 20/20. No change in phorias. Given 5 treatments after which he repeated and passed eye test 20/20 each eye. (Naked V. A.) He was re-examined five weeks later and V. A. remained unchanged.

No. 1079. Mr. J. O. T. Age 26. Production man. This patient failed vision test Coast Guard Reserve. Naked V. A. O. D. 20/60 — 1. O. S. 20/40. Had: O. D. — 1.25 ⌒ — 1.00 × 85 = 20/20. O. S. — 1.25 ⌒ — .50 × 55 = 20/20. c P. R. 2 △ exo. P. P. 10 △ exo. No change of Rx. needed. Given one treatment without any apparent improvement in V. A. Patient was advised against continuing.

No. 1192. Mr. D. L. O. Age 19. Student. Scheduled to take examination for Army ROTC, but was told his naked V. A. was inadequate. Had: O. D. — 1.25 ⌒ — .25 × 90 = 20/20. O. S. — 1.37 sph. = 20/20. Naked V. A. O. D. 20/200. O. S. 20/200 —. Phorias c P. R. ortho. P. P. 1½ △ exo. s P. R. 1△ exo. P. P. 7 △ exo. After three treatments over a period of two weeks patient passed eye test: O. D. 20/70. O. S. 20/70.

No. 1440. Mr. G. B. A. Age 17. Auto-mechanic. Patient was advised to have his vision improved in order to pass test for Army Air Corps. Naked V. A. O. D. 20/30 — 1. O. S. 20/25 — 1. (needed 20/20 each eye.) Had: O. D. — 1.25 cyl. × 180 = 20/20. O. S. + .25 ⌒ — .75 × 180 = 20/20. c Phorias: P. R. ortho P. P. 3 △ exo.

Needed no change of glasses. Given five treatments. Patient passed Army Air Corps eye test: 20/20, naked vision O. U.

No. 1283. Mr. C. C. A. Age 25. Machine Assembler. Patient failed vision test Army Air Corps. Had no glasses. Naked V. A. O. D. 20/30 +. O. S. 20/30 — 1. (Needed 20/20 each eye.) Rx needed at first examination: O. D. — .50 cyl. × 180 = 20/20. O. S. — .25 ⌒ — .50 cyl. × 180 = 20/20. Phorias: s P. R. 1 △ exo. P. P. 3 △ exo. This Rx was not prescribed at the time. Given ten treatments spread over a period ranging from April 30, 1943 to July 10, 1943, when he passed eye test 20/20 each eye for Army Air Corps. Moreover, was prescribed: O. U. + .25 ⌒ + .25 cyl. × 90 = V. A. 20/20 each.

No. 1394. Mr. K. A. Age 17. Student. Patient failed vision test Navy Air Corps. Naked V. A.: O. D. 16/20. O. S. 15/20. Had prescription for O. D. — .62 sph. O. S. — 0.25 sph. which he did not have filled. This correction gave him 20/20 each eye. Passed eye test Navy Air Corps 20/20 each eye after six treatments. Morevoer Mr. K. A. was prescribed: O. U. + .75 sph. — 20/20 each eye.

No. 1131. Mr. S. A. Age 20. Student. Patient failed vision test Naval ROTC. Naked V. A. O. D. 20/100. O. S. 20/200 (required V. A. 12/20 each eye.) Had: O. D. — 1.50 ⌒ — .50 × 90 = 20/20. O. S. — 1.75 ⌒ — 100 × 90 = 20/20. Phorias: c P. R. ortho P. P. 5 △ exo. Glasses not changed. Passed eye test 12/30 each eye after three treatments two of them taken over a period of two weeks.

No. 1159. Mr. C. M. A. Age 21. Student. This patient was scheduled to take examination for C. P. T. but was told to improve naked V. A. Naked V. A.: O. D. 20/100. O. S. 20/100 +. (required V. A. 20/40 each eye wide open). Wearing: O. U. — 1.25 sph. = 20/20 (not changed). Phorias: c P. R. ortho. P. P. ½ △ exo. s Rx. P. R. ortho. P. P. 2 △ exo. (Squinting: O. D. 20/60 — 1. O. S. 20/60 +.) Passed eye test O. D. 20/30; O. S. 20/25 naked vision after five treatments. Prescribed for near use. O. U. + 1.75 sph.

No. 1389. Mr. W. O. B. Age 20. Student, who had failed vision test V7 of Naval Reserve. Naked V. A. O. D. 20/60 — 1. O. S. 20/20 — 1. Had: O. D. — 1.25 sph. = 20/20. O. S. — .25 sph. = 20/20. (not changed). Phorias: c P. R. ortho. P. P. 2 △ exo. Prescribed for near use: O. D. + 1.50 sph. O. S. + .50 sph. Passed eye examination: O. D. 14/20; O. S. 20/20 after four treatments. Required naked V. A. 12/20 each eye.

No. 1183. Miss M. G. Age 21. Telephone operator—failed vision

test WAVES. Uncorrected V. A.: O. D. 20/40 +. (variable). O. S. 20/40 +. Had: O. D. + .25 cyl. × 90 = 20/20 —. O. S. + .50 cyl. × 90 = 20/20 —. Phorias s Rx. P. R. ortho; P. P. 1 △ exo. Prescribed that morning by another doctor: O. D. — .25 ⌒ + 1.50 × 95 = 20/20 —. O. S. + 1.50 cyl. × 85 = 20/40 —. Needed: O. D. + .75 cyl. × 90 = 20/20 —. O. S. + .75 cyl. × 90 = 20/20 —. Phorias: P. R. ortho; P. P. 2 △ exo. Given two treatments. Passed vision test 20/20 each eye. V. A. with new Rx 20/20 + each eye.

No. 1134. Miss C. H. Age 23. Bookkeeper. This patient failed vision test in WAVES, (needed 7/20 one eye; 6/20 the other.) O. U. 12/20 corrected to 20/20 each. Naked V. A. O. D. 20/100. O. S. 20/200 +. Had: O. D. — 1.75 ⌒ — .50 × 165 = 20/25. +. O. S. — 2.50 ⌒ — .25 × 180 = 20/30. c P. R. 2 △ exo. P. P. 12 △ exo. s P. R. 2 △ exo. P. P. 17 △ exo. Needed: O. D. — 1.50 ⌒ — 1.00 × 180 = 20/20. O. S. — 1.75 ⌒ — .75 × 180 = 20/20. c P. R. 5 △ exo. P. P. 12 △ exo. Given four treatments and O. U. + 1.50 sph. for all near use. Passed eye test 8/20 each eye; 12/20 O. U.

No. 1066. Mr. G. A. H. Age 27. Chemical engineer. This patient had planned to join Naval Reserves but was told by his eye specialist that he didn't have necessary V. A. either with or without glasses; and furthermore that it couldn't be improved either with glasses or with exercise. These were not attempted. He had been wearing glasses for many years and was re-examined shortly before this examination. Lenses were not changed. Naked V. A. O. D. 20/60. O. S. 20/70 + 2. Had: O. D.—1.50 sph. = 20/20—3. O. S.—1.25 ⌒ — .25 × 180 = 20/25. c P. R. 5 △ eso. P. P. 3 △ eso. Needed: O. D. — 1.25 ⌒ — .25 × 90 = 20/20. O. S. — 1.25 sph. = 20/20. c P. R. 3 △ eso. P. P. 5 △ eso. (glasses not changed. Given O. U. + 1.75 sph. for all near use for duration of treatment. V. A. after five treatments: No glasses: O. D. 20/30. O. S. 20/30. c old glasses 20/20 +. 20/20 +.

No. 1403. Mr. R. J. H. Age 18. Failed vision test Army Air Corps. Had no glasses. Naked V. A. O. D. 20/40 —. O. S. 20/30 —. Phorias: s P. R. 3 △ eso. P. P. ortho. Needed: O. D. + .25 cyl. × 90 = 20/20 —. O. S. + .37 cyl. × 90 = 20/20—. Add + .75 sph. for near. (this made P. P. phoria 4 △ exo.) Glasses not prescribed, although their use was advised. Four treatments improved naked V. A. to 20/20 each eye.

No. 1126. Mr. H. N. H. Age 18. Student. This patient had failed vision test in the Naval ROTC. Naked V. A. O. D. 20/60. O. S. 20/30. At recruiting station: O D. 9/20. O. S. 17/20. Had: O. D. — 1.00 cyl. × 165 = 20/20. O. S. — .50 cyl. × 10 = 20/20. c

P. R. 1 △ exo. P. P. 3 △ exo. After three treatments passed vision test: O. D. 13/20. (needed 12/30 each eye). O. S. 17/20. Was re-examined seven months later and again passed test. Naked V. A. this time: O. D. 17/20; O. S. 20/20.

No. 1130. Mr. W. P. H. Age 18. Student. This patient was granted a waiver of 20/70 each eye for a specialist's rating in the Coast Guard Reserve. Naked V. A. O. D. 20/100 — 1. O. S. 20/200. Phorias: c Rx: P. R. ortho. P. P. 5 △ eso. Had: O. D. — 2.00 ⌒ — .25 × 90 = 20/20. O. S. — 2.25 ⌒ — .25 × 90 = 20/20. s Rx: P. R. & P. P. ortho. Lenses needed no changing. Four treatments given. Passed eye test for Coast Guard Reserve. Naked V. A. 20/50 each eye.

No. 1050. Mr. R. W. H. Age 25. Student. This patient wanted naked vision improved to enable him to stay in his ROTC unit. Needed 20/200 each eye. Correctible to 20/30. Naked V. A.: O. D. 20/300— (squinting very hard). O. S. 20/200 — (barely saw outline). Had O. D. — 2.75 ⌒ — 1.00 × 90 = 20/20. O. S. — 2.00 ⌒ — 1.00 × 90 = 20/20. c P. R. 1 △ eso. P. P. 2 △ eso. s. P. R. 1 △ eso. (lenses not changed). 6 △ exo. Treatment started Sept. 2, 1942. Given 19 treatments between that date and April 12, 1943, when he passed eye examination for Army Officers' enlisted reserve 20/100, each eye wide open.

No. 1165. Miss M. N. K. Age 23. Bookkeeper. This patient failed vision test WAVES (needed 6/20 each eye; 12/20 both). Naked V. A.: O. D. 20/100 — 1. O. S. 20/100 — 1. Had: O. D. — 2.50 ⌒ — .50 × 180 = 20/20—. O. S.—3.00 ⌒ — .50 × 180 = 20/20 — 3. c P. R. ortho. P. P. ortho. s. P. R. 1 △ exo. P. P. 5 △ exo. Needed: O. D.—2.00 ⌒ — .50 × 175 = 20/20. O. S.—2.25 ⌒ —.75 × 5 = 20/20. c P. R. ortho. P. P. 2 △ exo. O. U. + 1.75 worn constantly over old glasses and five treatments improved naked V. A. to 12/20 each eye and helped Miss K to pass test. Three months later she passed vision test, in addition to others, for officers' candidates school. (12/20 naked V. A. each eye).

No. 1062. Mr. I. K. Age 21. Student who was aware of having color vision defect. Stated visual acuity adequate for his needs. Expected to join armed forces; wanted existing abnormalities corrected. (needed naked V. A. 12/20 each eye). Naked V. A. O. D. 20/30 — 2. O. S. 20/30 — 2. Had: O. D. — .25 ⌒ — .50 × 75 = 20/20. O. S. — .25 ⌒ — .50 × 90 = 20/20. Needed: O. D. — .50 cyl. × 50

= 20/20 +. O. S. — .25 cyl. × 120 = 20/20. Add + .75 sph. O. U. for near. Examined color perception by routine tests already described and found anomaly to be one of shade ignorance and weakness. Threshold of perception and discrimination within apparently normal limits. First test on A. O. Pseudo-Isochromatic plates follows:

| Plate | Content | Seen As | Plate | Content | Seen As | Plate | Content | Seen As |
|---|---|---|---|---|---|---|---|---|
| 1 | 89 | nothing | 9 | 25 | 25 | 17 | Design | 45 |
| | 43 | 43 | | 68 | 68 | | Design | 27 |
| 2 | 56 | 56 | 10 | 5 | 2 | 18 | Traceable | nothing |
| | 27 | 2 | | 3 | 5 | | Designs | nothing |
| 3 | 8 | 3 | 11 | 97 | 97 | 19 | 052 | 052 |
| | 6 | 5 | | 34 | 34 | | 394 | 394 |
| 4 | 39 | 28 | 12 | 56 | nothing | 20 | 23 | nothing |
| | 42 | nothing | | 27 | nothing | | 65 | nothing |
| 5 | 56 | 56 | 13 | 12 | 12 | 21 | 15 | 15 |
| | 27 | 27 | | H | H | | 74 | 74 |
| 6 | 29 | 70 | 14 | 89 | nothing | 22 | 47 | nothing |
| | 57 | 35 | | 43 | 43 | | 98 | nothing |
| 7 | 86 | 86 | 15 | 86 | nothing | 23 | Design | nothing |
| | 75 | nothing | | 75 | nothing | | Design | nothing |
| 8 | 7 | 7 | 16 | 52 | 52 | | | |
| | 9 | 9 | | 96 | 96 | | | |

Given three color vision training periods and one for visual improvement. Passed eye test both for color and vision. Naked V. A. O. D. 20/20; O. S. 18/20. Color vision accurate and easy.

No. 1343. Miss M. L. K. Age 20. Failed vision test WAVES with and without glasses. Had: O. D. — 2.25 ⌒ — .50 × 75 = 20/20. O. S. — 2.00 sph. = 20/200. Naked V. A. O. D. 20/100. O. S. 20/400 —. (pinhole vision O. S. 20/50). c P. R. 5 △ eso. P. P. 5 △ eso. same without Rx. Needed: O. D. — 2.00 ⌒ — .50 × 90 = 20/20 —. O. S. — 3.25 ⌒ — .50 × 180 = 20/70. P. P. O. D. J. 37 type. O. S. J 1.75 type. Phorias unchanged. This patient had a history of Strabismus when young. Anomalous projection O. S. Case treated for amblyopia ex-anopsia. After seven daily treatments, passed vision test for WAVES. Uncorrected V. A. c new Rx: O. S. 20/30 — 1., without Rx 20/60. Could read individual letters O. S. on 20 foot line c Rx.

No. 1168. Mr. H. P. Age 21. Trainee in C. P. T. This patient noticed his naked vision getting progressively worse. Possibility that forthcoming vision tests may disqualify him. Naked V. A. O. D. 20/60 —. O. S. 20/30 —. s Rx P. R. 1½ △ eso. P. P. ortho. Had three pair glasses: (1) O. D. — .75 sph. = 20/20 —. O. S. — .50 ⌒ — .25 × 90 = 20/20 —. (2) O. D. — .25 sph. O. S. + .50 sph. (3) O. U.

+ 1.75 sph. in fitover frames for near use. Needed: O. D. — .75 ⌒ — .50 × 90 = 20/20. O. S. — .50 ⌒ — .50 × 90 = 20/20. This correction not prescribed. Instead the patient was given O. U. + .50 sph., for constant wear and was advised to use his fitover glasses for all near work. Two treatments were given. Patient left for a training center in a different city where he passed all subsequent tests. I examined him five months later. His naked V. A. was: O. D. 20/30 — 1; O. S. 20/20—2. (eyes wide open). Eyes were re-examined two months afterwards and his naked V. A. was: O. D. 20/30; O. S. 20/20.

No. 1158. Mr. W. M. P. Age 19. Failed vision test in Coast Guard Academy and was dismissed. Naked V. A. O. D. 20/30 —. O. S. 20/20 —. s Rx. P. R. 2 △ eso. P. P. 2 △ exo. Had: O. D. — .50 ⌒ — .50 × 105 = 20/20 O. S. — .50 ⌒ — .25 × 90 = 20/20. c P. R. 1 △ eso. P. P. 4 △ eso. Needed: O. D. + .25 cyl. × 180 = 20/20 —. O. S. + .25 cyl. × 180 = 20/20. Prescribed temporary correction O. U. + .25 sph. for constant use and O. U. + 2.00 sph. additional in fitover frames for all near use. Given twenty-two treatments over a period of 6½ months. Passed coast guard academy vision test 20/20 each eye.

No. 1099. Dr. J. L. R. Age 40. Physician. This patient had failed vision test for the Naval Reserve. Granted waiver to 7/20 naked vision but could not pass that. Naked V. A. O. D. 20/20. O. S. 20/200. Had: O. D. + .50 ⌒ + .25 × 90 = 20/20. O. S. — 2.50 ⌒ + 4.75 × 90 = 20/25. c P. R. ortho (same s Rx) P. P. 6 △ exo. Needed: O. D. — no change. O. S. — 1.75 ⌒ + 4.25 × 90 = 20/20. Case treated as amblyopia. Given 14 treatments. Passed eye examination. Naked V. A., eye wide open, 7/20 +. Could also read that line at 10 ft. with ease.

No. 1348. Mr. W. L. W. Age 20. Army Air Corps Enlisted Reserve. Would like to transfer to active duty in Air Corps but naked visual acuity was inadequate, besides thinks he has color vision abnormality. Naked V. A. O. D. 20/25 — 1. O. S. 20/60 —. c P. R. ortho. P. P. 2 △ exo. Had: O. D.: Plano = 20/25 — 1. O. S. — .75 ⌒ + 1.50 × 5 = 20/20 —. (no change needed).

Nine treatments were given, including those for color vision. Naked V. A. improved O. D. 20/20; O. S. 20/25. Color vision tests indicated very slight anomaly of the color sense. Threshold of color perception and discrimination was apparently normal. Holmgren test done accurately. Stillings plates read accurately. A. O. Pseudo-Isochromatic Test follows:

| Plate | Content | Seen As | Plate | Content | Seen As | Plate | Content | Seen As |
|---|---|---|---|---|---|---|---|---|
| 1 | 89 | 89 | 9 | 56 | nothing | 16 | 52 | 52 |
| | 43 | 43 | | 67 | nothing | | 96 | 96 |
| 2 | 56 | 56 | 10 | 5 | 5 | 17 | Design | Design |
| | 27 | 27 | | 3 | 2 | | Design | Design |
| 3 | 8 | 3 | 11 | 97 | 96 | 18 | Traceable | Traced |
| | 6 | 5 | | 34 | 34 | | Designs | both Designs |
| 4 | 39 | 29 | 12 | 56 | 56 | 19 | 052 | 052 |
| | 42 | 72 | | 27 | 27 | | 394 | 394 |
| 5 | 56 | 56 | 13 | 12 | 12 | 20 | 23 | 88 |
| | 27 | 27 | | H | H | | 65 | 65 |
| 6 | 29 | 2 | 14 | 89 | 89 | 21 | 15 | 15 |
| | 57 | 55 | | 43 | 48 | | 74 | 21 |
| 7 | 86 | 86 | 15 | 86 | 86 | 22 | 47 | 47 |
| | 75 | 75 | | 75 | 75 | | 98 | 98 |
| 8 | 7 | 7 | | | | 23 | Design | Design |
| | 9 | 9 | | | | | Tr.Design | Tr.Design |

Passed color vision test accurately and easily; also vision test O. D. 20/20. O. S. 20/25.

No. 1204. Mr. W. D. R. Age 17. Expected to be drafted and wanted vision in right eye improved to enable him to join any branch of the Army Air Corps. Vision in that eye has been defective since early childhood from strabismus, which had become corrected with glasses. Had no glasses at the time of examination. Naked V. A. O. D. 20/200 —, (pinhole V. A. 20/80 — 1, at near, sub-caption newspaper headline type). O. S. 20/25 —. Needed: O. D. + .50 ⌒ + .50 × 90 = 20/200. (not prescribed). O. S. + .50 cyl. × 80 = 20/20. Right suppression, marked torticollis, ocular motility smooth and extensive monocularly. Treated as amblyopia and given six treatments, improving naked V. A. to: O. D. 20/60 +. Discontinued treatment: was drafted.

No. 1448. Mr. A. D. S. Age 21. Student. This patient had failed vision test Army Air Corps. Naked V. A. O. D. 20/20 — 1. O. S. 20/40 — 1. s P. R. 1 △ exo. P. P. 3 △ exo. Had no glasses. Needed: O. D. — .50 cyl. × 180 = 20/20. O. S. — .50 ⌒ — .25 × 180 = 20/20. c P. R. 1 △ exo. 3 △ exo. Instead of Rx needed, given temporary glasses: O. U. + .50 sph., for constant use over period of treatment, nine of which were given. Passed eye and complete physical examination army air corps. Naked V. A. 20/20 each eye.

No. 1364. Mr. E. F. W. Age 17. Foundry worker, who had failed vision test Naval Enlisted Reserve. Naked V. A. O. D. 20/60 — 1. O. S. 20/70 — 1. Had: O. D. + 1.50 cyl. × 105 = 20/30 —. O. S. + 1.25 ⌒ + 1.50 × 75 = 20/40 — 1. c P. R. 2 △ eso. same

without Rx. P. P. 1 △ eso. Needed: O. D. + .25 ⌒ + 1.50 × 100 = 20/25. O. S. + 1.25 ⌒ + 1.50 × 80 = 20/30 —. Case treated as amblyopia. Given seven treatments (took them during week's vacation). Naked V. A. O. D. 20/40 +. O. S. 20/40. With new Rx: O. D. 20/20 —. O. S. 20/30 +.

No. 1444. Corp. J. S. W. Age 22. Corp. Army Air Corps Ground crew. Wanted to transfer to flying services. Required naked V. A. 20/30 each eye, correctible to 20/20 (new requirements). Naked V. A. O. D. 20/50. O. S. 20/60 — 1. s P. R. ortho. P. P. 5 △ exo. Had: O. D. — .50 ⌒ — .50 × 90 = 20/20. O. S. — 1.25 sph. = 20/20. c P. R. 1 △ eso. P. P. 2 △ exo. Lenses not changed. Given two treatments after which naked V. A. was: O. D. 20/25; O. S. 20/30. Passed regular eye test and flight physical examination for Army Air Corps. Given O. U. + 2.00 sph. in fitover frames to be worn over his regular glasses for all near use.

## OBSERVATIONS

A most interesting observation for which adequate explanation is lacking is that in a comparatively small number of cases was there a marked or noticeable change (or any change at all) in the degree of the ametropia, or in the optical correction. In many cases, the original correction worn remained unchanged.

Of the myopes treated the largest group by far had exophoria of varying degrees both at near and distance. In most cases, treatment or lenses produced very little change in the heterophoria. Only a comparatively small group had esophoria. In this group, the heterophorias became altered when the ophthalmic correction was changed. Plus spherical lenses for near, either in fitover frames or prescribed as separate glasses (bifocals were not used) were used in most cases irrespective of the heterophoria. These were found to be highly beneficial in the vast majority of myopia cases when given in conjunction with training. The newly acquired visual acuity remained stationary over a period of many months, despite strenuous use of the eyes and long hours of work or study.

The amplitude and reserves (qualitative and quantitative) of the accommodation were measured in all cases of defective vision. In all myopia cases the amplitudes were found to be in accordance with the Donders' table, either before treatment or afterwards, with or without correction. Amblyopes invariably showed impaired accommodation

amplitudes or lowered reserves. The size type used in most cases had to be several points larger than for normal or myopic eyes.

That a certain degree of incongruity exists between the naked visual acuity and the ophthalmic correction often required to obtain normal visual acuity is a recognized fact. It is not uncommon to improve 20/100 vision to 20/20 with — .62 diopter spheres or less while other cases of similar acuity required — 1.50 diopter spheres or more to obtain similar results.

The basic principle of the training procedure in myopia and cases where ocular strain is indicated is the relaxation of seemingly overstrained muscles. To maintain this state of relaxation by preventing muscular strain to which such eyes seem to be susceptible, the use of plus spherical correction for all near point, and the observance of the simple rules on ocular hygiene have proven to be invaluable. Complete mental and physical relaxation is also imperative for best and most lasting results.

Differentiation between functional heterophoria and induced, insofar as this work is concerned, seemed to be of doubtful value as a prognostic factor. Nevertheless, a complete examination of the extra-ocular muscle functions was made before and after the refractive examination in every case of defective vision including amblyopia. Pseudo-myopes and myopes with esophoria, especially those whose esophoria became increased with additional minus lenses, invariably were the easiest cases to correct. Nevertheless, very few myopes with exophoria failed to respond to correction. The length of time required was somewhat extended but the results were equally gratifying.

In the training of amblyopia ex-anopsia, strabismus and heterophorias, the results obtained seemed to be directly dependent upon the effort exerted. In many of these cases patients were given daily treatments, for hours at a time. In all these, the training and development of vision was of utmost concern, hence much time and the greatest effort was exerted toward that end. As vision became improved, training of the binocular co-ordination became a comparatively simple matter. In each case a definite step by step program previously outlined was followed.

// No problem relating to vision has caused so much bewilderment and aroused as much discussion and controversy as has color-blindness. That the ophthalmic profession as a whole was caught unprepared is generally conceded. Optical physicists and psychologists found them-

selves in a similar predicament with iron-clad theories on cause and effect being expostulated but no attempt being made to sound out possibilities of retrieving at least a portion of those labelled as color blind. This appellation is being applied generally without regard for the degree of the defect, circumstances under which tests are made, the quality of the tests, the ability and experience of the examiner, the intelligence and mental level of the subject and the conditions under which the test objects are presented.

From a clinical viewpoint, these factors are highly important, in fact so important that they received attention at the symposium on color-blindness conducted by the Inter-Society Color Council for the Optical Society of America in the Winter of 1943.[9]

Many subjects classified as color blind and therefore barred from services where normal color vision is required, were trained and subsequently made available to the same services which had formerly rejected them despite much more difficult tests and skeptical examiners.

Once in the service, physical and color vision tests are repeated periodically. That these former rejectees are able to repeat these tests successfully should serve as an indicator as to the value of the training procedure. It is easy enough to memorize the Pseudo-Isochromatic plates, but to retain in memory their exact content, sequence, type, etc. over a period of many months, in addition to a rather full military and scientific program, is a mental feat. Any experienced examiner, it seems, would know how to recognize the difference between actual seeing and memorized repetition. Therefore the question raised as to the ability of reconditioned color defectives to carry over their recently acquired ability to practical conditions of flying and so forth is a question that may be answered by the fact that those men are able to pass stringent tests at various times including some which they have never taken before. Furthermore, the fact that they can stand up under gruelling training and in some instances in actual combat, may be construed as possible proof of the ability of such retention. Beyond that, neither I nor anyone else can tell for certain.

I had occasion to re-examine, periodically, many such patients who were trained and discharged as corrected many months before. They all seemed to have retained normal sense of color recognition. All these men have undergone and passed physical examinations including tests for color vision several times.

Color defectives are considered suitable for correcting if the subject's

threshold of color perception equalled or approached my own. The quality of all other tests is of secondary consideration. My prognosis of a case is based on this observation.

Before allowing a patient to repeat a test for color vision, he is required to become proficient in:

1. Assorting and naming transparent colored glass marbles.
2. Sorting and naming colored papers of varying shades.
3. Naming projected colored spots of light under varying intensities of illumination and color mixture, saturation and threshold visibility. Smoke and amber filters are used in conjunction with these tests.
4. Reading color vision testing plates. Sequence is avoided. Plates are exposed at random and split up in such a manner as to make association virtually impossible.

## CONCLUSION

It is the purpose of this paper to report data of results obtained and not to review literature on the subject, of which there is very little, or to discuss theories. Had such results been obtained in an occasional case, it might perhaps have been regarded as a lucky occurrence, but when they are obtained consistently in many cases, it can no longer be considered coincidental. The percentages of successful results are unusually high, considering the types of cases handled.

In a sense, this paper may be considered a report of an experiment, an uncontrolled experiment, unless we are to regard previous rejections as part of the control. If it is to be so regarded, the work bids to be investigated further and many of the phenomena observed given due scientific explanation. From the practical standpoint, however, reconditioning and rehabilitating anomalous visual functions is a proven fact indeed.

This is only a preliminary report and while there seems to be no apparent connection between muscle anomalies, defective color vision, myopia and amblyopia, the object of reporting them as one group is purely of clinical value. This is aside from the fact that many of the cases had compound anomalies. Strictly speaking, however, there is no less heterogenuity in a report of this kind than in one on muscle abnormalities wherein all types of anomalies are treated.

I have followed very closely literature on the subjects discussed in

this report and believe that many of the procedures described in this paper are presented for the very first time, they being original contributions to orthoptic technique. Notable among these are:

1. A simple procedure for differentiating true (congenital) defects of color vision from anomalous conditioned defects (low discrimination) by the recognition of projected colored light, natural and mixed at the threshold of luminosity. Also methods used in teaching differentiation, recognition and discrimination of colors and shades.
2. Routine for examining visual and muscle defectives.
3. Methods for improving V. A. in myopes and amblyopes.
4. Rule for speedy reconditioning of muscle and visual defectives.

I am purposely presenting an exceptionally large and heterogeneous group of cases in order to show the extent of the experiment. The complete number of cases handled by the writer up to and since September 1943 is much more than double this amount. Furthermore, the cases reported are those which originally showed least promise of improvement. Judging from the results obtained, the percentages of reconditioning are extremely high. They will undoubtedly be even higher when the final report containing all the cases is written.

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AMERICAN JOURNAL OF OPTOMETRY
*and* ARCHIVES *of*
AMERICAN ACADEMY OF OPTOMETRY

Established 1924

Vol. 22 NOVEMBER, 1945 No. 11

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Publication and Academy Office: 1502 Foshay Tower, 821 Marquette Ave.
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Annual Subscription, $5.00 in Advance; Canada, $5.50; Foreign, $6.00;
Single Copies, 50c.

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Published Monthly by the
AMERICAN JOURNAL OF OPTOMETRY PUBLISHING ASSOCIATION

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## CURRENT VIEWS ON OPTOMETRIC PROGRESS

Optometrists are fortunate in occasionally having their good friends in higher educational circles give them their current views on the progress the profession is making. Recently Dr. Irwin A. Conroe, Assistant Commissioner, Department of Education of New York, spoke before a meeting sponsored by the Public Health Bureau of the New York State Optometric Association.[1] Dr. Conroe indicated that progress had been made within optometry and that many outstanding opportunities await the optometrists of America in the post war era. He also pointed out,

[1]Optometry's Opportunities—Now and in the Post-War Period. Irvin A. Conroe.

that to achieve the successes necessary by this profession that in his judgment considerable sound planning and work remained to be done. Dr. Conroe places before the profession the following outline for use in charting its immediate future:

1. "That there be mutual good will established among the practicing officers and among Optometrists themselves. To achieve this goal, all of us should remove first the beam from our own eyes before undertaking to remove the mote from our neighbor's eye.
2. "That the public become convinced of the service of Optometrists and the service of the profession. This cannot be achieved until every practitioner of Optometry places sufficient importance upon his professional services and manifests that he is practicing a profession, and not operating a trade.
3. "That Optometrists work closely together in harmony and professional fellowship, and for the welfare of the profession and the public generally. This means that each Optometrist learn to put the welfare of his profession and his patients before economic gain.
4. "That Optometrists in every way and in far greater numbers interest themselves in scientific professional advancement. Only by increased activity, by the rank and file of Optometrists in scientific research, leading to improvements in professional skill and knowledge can the profession be side by side with other professions. To stagnate is to die.
5. "That leaders of the profession produce for public scrutiny and criticism a constructive program of far reaching objectives and plans for making that program effective. United, unified effort for a common cause, decisive, concerted action, dignified and visionary; confidence in its own leaders, and ability! These are essential to Optometry.
6. "That Optometry must meet fairly and clearly the problems before it, through education, if you please; through legislation, if necessary; through regulations, if they seem to be the order of the day; or through other channels, or any combination of channels. And this means honestly attacking at their sources, cankers and diseases—eating at the root of your profession.
7. "That Optometry undertake its mission with confidence in its own ability, and with a sufficient initiative to do the job without artificial stimulus."

This program outlined by Dr. Conroe is one which merits the thought and attention of every practicing optometrist. We are appreciative of his interest and good will and optometrists everywhere will accept his advice and work to bring to a proper fulfillment the suggestions offered by him. In general, educators are aware of the possibilities for public service afforded by optometry and as educators they are naturally desirous of having optometric work performed in the finest possible manner. Dr. Conroe emphasizes this point in closing, by saying.

> "We are all keenly interested in the affairs of Optometry, for they affect the life stream of the public. The prestige of Optometry, therefore, becomes prestige to State Departments of Education, and to National Governments which may administer the professional laws governing the practice of the profession. I would observe, however, that no amount of legislation, of rules or regulations by state or by national bodies, can raise your profession to its full stature. Education will help. Legislation may direct. But unless the individual Optometrist senses his own responsibility and opportunity, and sets the rule and guide for his own conduct and ethics, the profession cannot go forward."
>
> CAREL C. KOCH

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## TRANSACTIONS OF THE AMERICAN ACADEMY OF OPTOMETRY

**A department devoted to announcements, reports, appointments, organization data, news, professional problems and ideals, as these relate to the Academy.**

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## ACADEMY TO MEET AT COLUMBUS

Following is the tentative program of the 1945 meeting of the American Academy of Optometry to be held on December 9, 10, 11, and 12 at the Deshler Wallick Hotel in Columbus, Ohio.

Sunday, December 9th

9:00 A. M. Registration, Dr. Carel C. Koch, Secretary and A. Virginia Flatten, Assistant Secretary, (1502 Foshay Tower, Minneapolis, 2, Minn.) in charge.

10:00 A. M. Business Session, Dr. J. Fred Andreae, President, (901-02 Lexington Bldg., Baltimore, Md.) in charge.

1:00 P. M. Instruction Courses, Dr. C. W. Morris, (230 Utility Bldg., 116 E. Wayne St., Ft. Wayne, Ind.) in charge.

This session of about four hours will be devoted to courses of instruction in practical subjects and techniques of value to optometrists. To teach courses in ocular pathology Dr. Morris has secured the services of Dr. Mortimer Mann, a faculty member of the Dept. of Ophthalmology of Indiana University. Dr. Mann will lecture on ophthalmoscopy and will correlate ophthalmoscopic observations with optometric data and ophthalmological diagnosis, and will attempt to point out the symptoms which would indicate the need for further investigation such as field charting.

7:30 P. M. Guest Speaker (to be arranged) and contributed Papers. Dr. D. G. Hummel, (419 Guardian Bldg., Cleveland, Ohio) in charge.

Monday, December 10th

9:00 A. M. Section on Orthoptics and Contributed Papers on Orthoptics. Dr. Marguerite Thoma Eberl (1305 Wisconsin Tower, 606 Wisconsin Ave., Milwaukee, Wis.) in charge.

This session of the Academy Meeting will be given over entirely to Visual Training with special emphasis upon the problem of myopia and the functional disabilities of school children. During the first period the paper presented will give a general view of the subject. This will cover the basis, and the purposes of training, the selection of cases the frequency and duration of training, and the general outline of procedures. During the last period, demonstrations of the various procedures and techniques will be presented to smaller groups.

(Anyone willing to contribute to these demonstrations is asked to communicate with Dr. Eberl. However since the general field of training is so broad, and since the time is so short, the Committee reserves the right to limit acceptance to those presentations which are particularly applicable to the work of the morning.)

1:30 P. M. Demonstrations of laboratory techniques and procedures in physiological optics at the Ohio State University. Members will meet at the office of the School of Optometry. Dr. Glenn A. Fry (School of Optometry, Ohio State University, Columbus, 10, Ohio) in charge.

7:30 P. M. Contributed Papers. Dr. D. G. Hummel in charge.

Tuesday, December 11th

9:00 A. M. Section on Contact Lenses and contributed papers on Contact Lenses. Dr. E. Freeman, (116 S. Michigan Ave., Suite 1311, Chicago, 3, Ill.) in charge.

This session will include papers and demonstrations as follows:

Dr. William Feinbloom, "Clinical Results with Tangent Cone Contact Lens".

Dr. J. S. Nupuf, Paper in preparation.

Mr. Robert Roth, Invited paper in preparation.

Dr. E. Freeman, Demonstration of contact lens fitting without anaesthetic.

1:30 P. M. Contributed Papers. Dr. D. G. Hummel in charge.

7:00 P. M. Formal Banquet. Dr. J. Fred Andreae in charge. The final selection of a banquet speaker has not been made.

Wednesday, December 12th

9:00 A. M. Contributed Papers. Dr. D. G. Hummel in charge.

1:00 P. M. Final Business Session. Dr. J. Fred Andreae in charge.

Contributed Papers

The several sessions set aside for contributed papers will include the following speakers:

Dr. Robert E. Bannon, "Astigmatism at the Near Point".

Dr. Robert Graham, "Reduction of Reflections from Ophthalmic Lenses".

Dr. Israel Dvorine, "Some observations on the Subject of Defective Color Vision".

Dr. V. J. Ellerbrock, "An Experimental Investigation of Cyclofusion".

Dr. E. Freeman, "Some Principles of Nomenclature".

Dr. Glenn A. Fry, "A Moveable Eyepiece for a Lens Centering Machine".

Dr. Arthur E. Hoare, "Nystagmus".

Dr. H. W. Hofstetter, "Accommodative Convergence in Squinters".

Dr. Lewis Kraskin, "Emotions and the Eye".

Dr. Julius F. Neumueller, "The Correlation of Optometric Binocular Measurements for Refractive Diagnosis".

Dr. Ernest Petry, "Some Factual Data on the Distribution of Myopia, Hyperopia, and Astigmatism in an Industrial Plant".

Dr. Charles Sheard, two papers in preparation.

Dr. S. Herman Shurin, "Field Charting".

Dr. Gordon L. Walls, "Color Aptitude, and Possible Means of Evaluating It".

Dr. Rita Walsh, "The Measurement and Correction of Hyperphoria in Refractive Cases".

H. W. Hofstetter, Chairman,
Papers Committee

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## CUYAHOGA ACADEMY OF OPTOMETRY

The Cuyahoga Academy of Optometry held its annual election of officers and the following men were elected.

Dr. R. S. Jordan—Chairman
Dr. Jos. Greger—Vice-Chairman
Dr. A. A. Schmidt—Secretary Treasurer
Dr. A. H. Wittlig—Director
Dr. H. H. Peters—Director

All members are looking forward to the Annual Academy meeting in Columbus in December and from all indications, the Cuyahoga Academy will be well represented.

A. A. SCHMIDT

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## NOVEMBER MEETING OF MINNESOTA CHAPTER

Dr. Rita Walsh, optometrist, of the Gailey Eye Clinic, Bloomington, Illinois, will be the speaker at the November meeting of the Minnesota Chapter of the American Academy of Optometry to be held at the Curtis Hotel, Solarium Room, Sunday, November 18, 1945 at 2:00 P. M. at Minneapolis.

Dr. Rita Walsh is well known to optometrists through her several years of work at Dartmouth Eye Institute at Hanover, New Hampshire. Her topic for this program will be "The Objective and Subjective Correction of Astigmatism." A registration fee of $3.00 per person will be charged. It is urged that all members of the Minnesota Chapter arrange to be present at this meeting to hear and discuss the problem of astigmatic corrections with Dr. Walsh.

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## SOUTHERN CALIFORNIA CHAPTER

Due to the illness of our President, Ernest A. Hutchinson, Vice President Arthur E. Hoare presided. The meeting was called to order at 5:45 P. M. October 12, 1945 at the Los Angeles Athletic Club. The minutes of the September meeting were read and by motion approved.

Fellow Hoare read correspondence he had had with Dr. Andreae regarding the Dr. Sheard paper. On motion it was received and filed.

A motion was made by Fellow Ketchum, seconded by Fellow Kinney that the policy of the National body of inviting to membership, in territories where local chapters exist, be referred to the National meeting by our delegates in December and a clearing of policy requested.

The nominating committee, consisting of Fellows Goodman, Deacon, and Winslow, reported, as their recommendation, that the present officers be reelected for the ensuing year. Fellow Ketchum moved, seconded by Fellow Goodman, that the recommendation be accepted and the officers be declared reelected, and that the secretary be instructed to cast a unanimous ballot to that effect. Motion carried. The proper ballot was then cast by the secretary.

Members present were: Fellows Hoare, Apel, Deacon, Dean, Goodman, Ketchum, Kinney, Jaques, and Weigmann. Guests: Major Neil J. Warren, Lt. Jerome B. Conloque U. S. N. R., Dr. Charles Blind, and Mr. Tuft.

Meeting adjourned for dinner.

After dinner, Major Warren, A. B., Ph. D., gave us a very interesting regime of the Test Program of the U. S. Army Air Corps.

Lt. Conloque made a short report of his experiences on board a flat-top.

JOHN R. DEAN

## ANNOUNCEMENTS

### REFRESHER COURSE ANNOUNCED BY PENNSYLVANIA STATE COLLEGE OF OPTOMETRY

The Pennyslvania State College of Optometry announces the inauguration of a Refresher Course to begin November 26, 1945. The course which has been particularly arranged for Optometrists returning from the Armed Forces will be of six months duration. A certificate of attendance will be given for its successful completion.

The refresher course will consist of subjects of direct application in practice: Optometry (didactic and clinical), Orthoptics and Visual Training, Ocular Pathology, Visual Fields, Neuro-ocular Anatomy, Ophthalmic Mechanics and Office Practice.

Members of the regular faculty of the college will teach the subjects

of the refresher course: Dean Albert Fitch, Julius Neumueller, B. S., O. D. John C. Neill, O. D. George A. MaeElree, Jr., O. D., Onofrey Rybachok, B. A., M. A., Harold Simmerman, O. D., J. Donald Kratz, A. D., O. D. and the clinical staff.

Veterans will be able to pursue the refresher course under the provisions of the G. I. Bill of Rights (Public Law 346)

For application or further information write to: Registrar, Pennsylvania State College of Optometry, Philadelphia 41, Pa.

The Pennsylvania State College of Optometry also announces the innaugaration of a graduate course for optometrists, in the fitting of Contact Lenses. The course will cover a period of two weeks of didactic and clinical instruction in all methods of fitting contact lenses. Instruction will include chemistry, optics, ocular anatomy and ocular pathology in the fitting of contact lenses. Five members of the regular college faculty will constitute the faculty for the course: J. C. Neill, O. D.; J. Nevyas, PhD.; G. A. MacElree, O. D.; O. G. Rybachok, M. A.; F. W. Sinn, O. D. Enrollment limited. Write or wire Registrar for reservation and information.

## DARTMOUTH EYE INSTITUTE

Because of demand we have available a third printing of Alfred Bielschowsky's "Lectures on Motor Anomalies" which is now on sale at Dartmouth College Publications, Hanover, New Hampshire, at $1.50 per copy, postpaid.

## MAYBEE CANADIAN MEMORIAL FUND

Some time ago, a W. G. Maybee Memorial Committee was appointed, consisting of G. M. Bosnell as chairman, E. J. Fisher, George W. Keevil, E. F. Attridge and J. W. Dee, Secretary-Treasurer. The purpose of this committee is to raise a fund as a memorial to W. B. Maybee, an optometrist who rendered outstanding services to the profession of Optometry in Canada. The purposes of this fund are:

Trusts—The Trustees shall hold the fund in trust for the Ontario College of Optometry for the following purposes:

(a) To rehabilitate in the practice of Optometry, graduate Optometrists, men and women who have served in any branch of His Majesty's Armed Forces; and/ or

(b) To establish in the practice of Optometry, graduate Optometrists who graduate from recognized Colleges of Optometry;

provided that the Fund shall not be applied for this purpose until in the opinion of the Trustees the work of rehabilitation as set forth herein has been achieved; and/or

(c) To establish scholarships tenable at the Ontario College of Optometry by undergraduate students on such terms as the Trustees may determine, and to make loans to undergraduate students to enable them to complete their education; and/or

(d) To promote research work in Optometry at the Ontario College of Optometry and to establish scholarships and make grants or loans for this purpose.

The Declaration of Trusts was passed by the Board of Examiners in Ontario and accepted by the Dominion Government. In the near future, every Canadian optometrist will be asked to donate to this worthy cause and we trust you will give this your earnest thought. At the present time, only the Supply Houses have been approached and they have responded very generously. The objective has been set at $50,000 by the trustees.

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## MEETING OF THE BETTER VISION INSTITUTE

The Better Vision Institute held its third quarterly meeting at the Park Lane Hotel in New York City on Friday, September 28. The attendance was one of the largest in the history of the Institute. Representatives from all branches of the industry were present along with prominent guests.

The feature of the meeting was a presentation of the Institute's new radio program which is currently being released over the facilities of 225 stations from coast to coast and in Canada. It was explained that 154 stations were sponsoring the programs on sustaining basis and that 71 were releasing the programs through the sponsorship of local Institute members and groups.

It was estimated that approximately ten million people are listening to these recorded radio presentations. 44 states were represented in the distribution as well as Canada where 21 stations are now carrying the programs. In his comments on this program, Mr. J. Julian, President of B. V. I., explained that 24 recordings had already been completed and were currently being broadcast. The series calls for 30 programs, so that, when completed, this radio feature will have run a cycle of 30 weeks.

Among the noted personalities of journalism, opera, and radio

who are featured in the series are the following: Dr. Gerald Wendt, Science Advisor of TIME, LIFE and FORTUNE; Mr. Robert Potter, Science Editor of the AMERICAN WEEKLY; Mr. David Woodbury, Science Editor of COLLIER'S Magazine; Miss Jane Pickens, singing star of radio and stage; Miss June Forrest of Radio City Music Hall and recent discovery of Sigmund Romberg; Miss Helen Jepson; and many others.

Along with the radio presentation, Mr. Julian outlined briefly the various other projects in which the Institute is currently interested. He pointed out, for example, that the demand for Institute folders is continuing at a high rate and that four new subjects, printed during the summer, were already out of print and were being reprinted. He explained further that the Institute's recent national ad which featured school children and which was entitled, A FIFTH FREEDOM IS IN SIGHT, had aroused considerable attention and interest, especially on the part of the utility group, which was planning to reproduce it in its association bulletin and in its local newspaper advertising campaigns.

A second Institute ad, entitled WHAT IS YOUR EYE Q?, had aroused extensive consumer interest. In this ad, the definition of the three professional groups was given and caused much favorable comment.

To supplement the advertising program, Mr. Julian pointed out that a number of magazines were currently preparing interesting articles on the subject of eyes and eye-care. Some of these advance stories were shown in proof form, and others described as they will probably appear.

The contacts of the Institute with industrial plants is continuing with the release of posters on a monthly-schedule basis.

Recent editions of Institute releases to newspapers throughout the country have carried four distinct features which tie in with the atomic bomb publicity.

The evolution of the Institute advertising themes, starting back in 1940, was outlined to show the continuity-planning in the Institute's attempt to mold public opinion.

As a preliminary to the general presentation of the Institute program by Mr. Julian, a report was given by Mr. E. E. Williams, Treasurer of the Institute, outlining the current financial position, and at the same time advising that the Finance Committee, of which Mr. Williams is Chairman, had made provision, at the meeting held earlier in the day, to provide for carrying on the Institute's many advertising and publicity activities—at the current high level—for 1946 and for

1947 as well. This presentation met with acclaim, as it reflected the vision which is bound to augur well for the development of the opticalsphere's influence in the future.

The meeting concluded with a presentation of a new series of national ads and professional ads which will appear during the forepart of 1946.

Following the luncheon, the meeting was addressed by Mr. Luke J. McCarthy, Marketing and Research Director for the Hearst Publications. Mr. McCarthy's talk was entitled "ADVERTISING AND SELLING FROM HERE ON." The gist of Mr. McCarthy's remarks was that the postwar competition among industries as well as among individual producers was bound to become more intensive as the scramble for the consumer dollar became more evident. He urged the continuation and the expansion of the excellent educational work which the Institute and the various optical manufacturers in the industry had so well started and are currently carrying on.

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## ANNUAL SEMINAR ON READING DISABILITIES

The Annual Seminar on Reading Disabilities will be conducted by the Reading Clinic, Department of Psychology, Temple University, from January 28 to February 1, 1946. Lectures, demonstrations, and discussions will be used to develop the central theme: *Differentiated Remedial and Corrective Reading.*

Topics for successive days are: Approaches to Analysis of Reading Disabilities, The Analysis Program, Case History, Social and Emotional Factors, Physical Factors, Capacity for Reading, Reading and General Language Achievement, Classification of Reading Problems, Remedial and Corrective Procedures. The activities of the Seminar will be differentiated to meet the needs of classroom teachers, remedial teachers, school psychologists, supervisors, administrators, neurologists, and vision specialists.

Advanced registration is required. For further information regarding the one-week Seminar, write to Dr. E. A. Betts, Director of the Reading Clinic, Temple University, Philadelphia (22) Pennsylvania.

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## EYE-BANK FOR SIGHT RESTORATION

Names of leaders in the fields of science, finance and business who will serve as members of a council in sponsoring the work of The Eye-

Bank for Sight Restoration, Inc., have been announced by the Executive Director of that organization.

The Council, headed by Albert G. Milbank, foundation president, will aid in the plan to establish a nation-wide eye bank for obtaining and making available healthy corneal tissue to restore the vision of persons whose sight has been lost through affection of the cornea. The plan which the Council is sponsoring includes research, study and instruction of ophthalmologists in the delicate surgery required in performing the corneal graft operation.

Fellowships which will enable advanced study in causes of corneal affections, and in methods to increase the time which corneal tissue may be preserved and made available for use in sight restoration operations, are also included in the plan.

Similar to the function of blood banks in restoring exhausted blood supply, the Eye Bank was organized to make possible restoration of the sight of persons whose vision has been destroyed because of corneal affections by replacement with healthy tissue from the eyes of other persons. Of the 250,000 persons in the United States who are presently blind, it is estimated that the sight of five to seven percent has been lost through opaque corneas, and that the vision of approximately 10,000 of those so affected might be restored if healthy corneal tissue were available for the corneal graft operation.

It is the purpose of the Eye Bank to locate, obtain and have accessible wherever and whenever needed the all-important corneal tissue. This "capital stock" of the Eye Bank may be obtained only from persons whose sight requires the removal of an eye whose corneal tissue is unimpaired, or by obtaining the healthy eyes of persons immediately after death.

Inasmuch as the effectiveness and serviceability of the Eye Bank depend upon the immediate availability of corneal tissue which must be taken from human eyes, it is necessary and important to educate both professional and lay groups in cooperating to make possible this latent procedure.

Under guidance of the Council, a movement has been launched to procure eyes removed from those whose corneal tissue is not affected, and also the eyes of persons of unimpaired vision immediately after death. At present, it is possible to preserve corneal tissue for utilization in the delicate graft operation for only seventy-two hours, therefore it is necessary to arrange for the speedy collection and preservation of eyes immediately upon removal.

Such a plan is already in limited operation among representative eye hospitals and surgeons in New York and several other cities, and it is part of the Eye Bank plan to expand this activity to include such institutions and the profession throughout the United States.

Operating from the Eye Bank's headquarters at 210 East 64th Street, New York City, the newly formed Council will sponsor a nation-wide movement to obtain donations of eyes suitable for restoring the sight of thousands already blinded by war and industrial accidents and that of others who may become blind, and to establish the Eye Bank on a sound financial basis.

## SPECIAL NOTICE

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When you are discharged or transferred to another theatre please advise us promptly. Give us the address where you last received the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY and your new address, either military or civil. Only by so doing can you hope to receive the full number of copies to which you are entitled. Subcriptions are still accepted from optometrists in the armed services at the special military rate of $2 per year.

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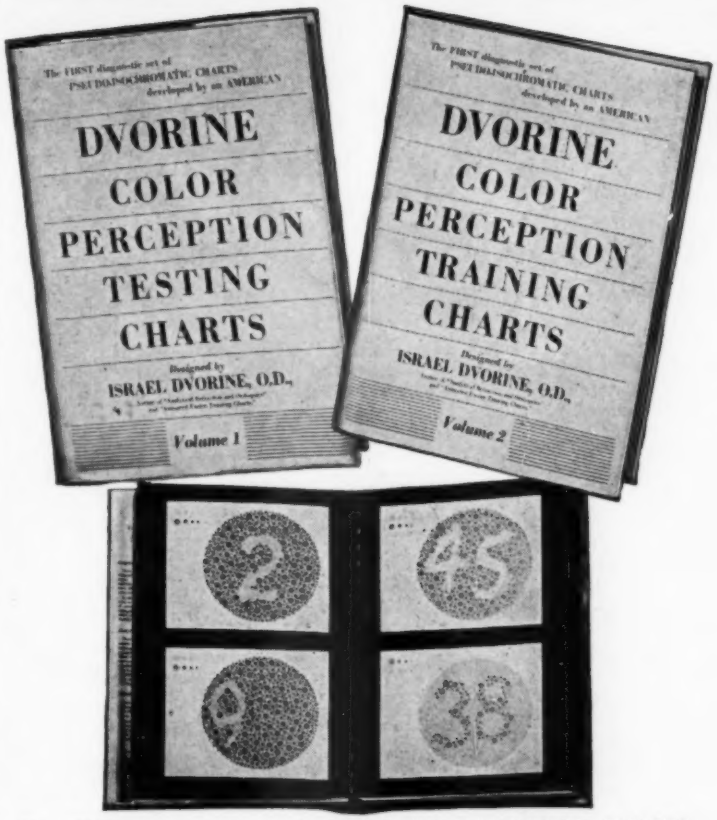


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## EDITORIAL NOTICE TO CONTRIBUTORS

The American Journal of Optometry and Archives of American Academy of Optometry is a monthly journal, published in annual volumes of about six hundred pages of reading matter each, illustrated where necessary, by cuts in the text.

About one-half of the space is devoted to technical articles, and the remaining half is given over to special departments, editorials, abstracts and book reviews, in large part original.

The papers and reports are original and are accepted only with the understanding that they are to be published in this journal exclusively.

The editors of the American Journal of Optometry and Archives of American Academy of Optometry beg to offer the following suggestions to authors who propose to favor them with the publication of their contributions:

I. Write on one side of the paper. Double-spaced, typewritten MS. is preferred.

II. Words to be printed in *italics* should be underscored once, in SMALL CAPS twice, and in LARGE CAPITALS three times. Antique type when called for should be so marked.

III. Be sure that the title of your paper indicates its contents. Should the subject be a general one, for instance, Case Reports, it would be well to mention the subject of each special report—for instance: Case One. Progressive Myopia with Exophoria. Case 2. Divergent Squint with Amblyopia. These special titles will appear in the table of contents of each number.

IV. Illustrations should be carefully drawn with India Ink on separate sheets.

V. When authors receive proofs for revision, they should correct and return these without delay. We beg, however, to remind our contributors that changes in the manuscript necessitates resetting, this causing much additional expense, so we ask that alterations be limited to what is of essential importance.

VI. Because of the added cost, we have discontinued the giving of gratuitous reprints to our authors, but we will supply them with these at the cost of press work and paper where so desired. The following tables of charges will apply for the year 1946.

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Prices for greater numbers furnished on request. Orders for reprints should be placed at the head of the manuscript, or should at the latest reach us before the Journal has gone to press.

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**American Academy of Optometry**
Foshay Tower, Minneapolis, Minn.

Dear Doctor Koch:

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